Supreme Court, U. S.
FILED
JUN 2 1975
MICHAEL RODAK, JR., CLERK

In the Supreme Court of the United States

No. 74-1518

THE TELEX CORPORATION and TELEX COMPUTER PRODUCTS, INC.
Petitioners,

vs.

INTERNATIONAL BUSINESS MACHINES CORPORATION,
Respondent.

Appendix to Petition for Writ of Certiorari, Containing Findings and Conclusions (Opinion) and Judgment of District Court and Opinion and Judgment of Court of Appeals

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Appendix A

Filed: Nov. 10, 1973

IN THE

United States District Court

FOR THE NORTHERN DISTRICT OF OKLAHOMA

No. 72-C-18
No. 72-C-89
(Consolidated)

THE TELEX CORPORATION

AND TELEX COMPUTER PRODUCTS, INC.,

Plaintiffs,

vs.

INTERNATIONAL BUSINESS MACHINES CORPORATION,

Defendant.

AMENDED FINDINGS OF FACT AND CONCLUSIONS OF LAW

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AMENDED FINDINGS OF FACT AND CONCLUSIONS OF LAW

GENERAL

Finding 1. This case involves the electronic data processing industry—an industry based upon a concept and system of reckoning (binary) as simple as turning on and off a switch; in which transmissions are timed in billionths of seconds (nanoseconds), storage capacity (memory), measured by millions of combinations of bits of information (megabytes); in which numerous

problems involving logic or arithmetic functions are separately but simultaneously worked upon and instantly solved within a single system; in which in their own peculiar language machines communicate with one another (multiprocessing) and then in words understandable by humans may present printouts of results at the rate of as much as 2,000 lines per minute; in which devices facilitate maintenance by the detection and isolation of their own malfunctions or mistakes (diagnostic programs); upon which most other industries of the country and countless businesses, as well as science and space explorations, vitally depend; in which product and market developments seem almost kaleidoscopic when viewed from the outside; which appears unique in monopoly context by reason of its youth and apparent dynamics, but which by the same token in this ultra-modern setting may be unprecedented also because of increased inducements for, and vulnerability to, sophisticated submarket control on the one hand, and massive industrial espionage on the other.

STATEMENT OF THE CASE—PRELIMINARY PROCEEDINGS

F2. This is an action brought by the Telex Corporation and Telex Computer Products, Inc. ("Telex") against the International Business Machines Corporation ("IBM") in pursuance of Section 4 of the Clayton Act (15 U. S. C. § 15) to recover treble damages for alleged violations of Sections 1 and 2 of the Sherman Act, 15 U. S. C. §§ 1, 2, and Section 3 of the Clayton Act, 15 U. S. C. § 13. IBM counterclaimed against Telex for alleged unfair competition, theft of trade secrets and copyright infringement in reliance upon state law and 17 U. S. C. § 101 with reference to the infringement of copyrights.

F3. Telex's initial complaint was filed on January 21, 1972, in the United States District Court for the Northern District of Oklahoma (Action No. 72-C-18), alleging IBM's monopolization

of, and attempts to monopolize, the worldwide manufacture, distribution, sale and leasing of electronic data processing equipment since 1954, and seeking damages in the amount of $238,290,000, trebled, injunctive relief, attorneys' fees, and costs. With the consent of the parties the issues and discovery for the purpose of these proceedings were limited to the United States.

F4. Concurrently with the filing of its complaint, Telex moved before the Judicial Panel on Multidistrict Litigation (JPML) in the matter entitled *"In re IBM Antitrust Litigation"*, Docket No. 18, to transfer its case to the United States District Court for the District of Minnesota for coordinated and consolidated pretrial proceedings with *Control Data Corporation v. International Business Machines Corporation,* 3-68 Civ. 312, and *Greyhound Computer Corporation v. International Business Machines Corporation,* 3-70 Civ. 329 (N. D. Ill. 70C 2203), both of which were then pending in that court.[1] On February 1, 1972, Telex amended its complaint to describe in more detail its monopolization claims relative to the manufacture, distribution, sale and leasing of plug compatible peripheral products which could be attached to an IBM central processing unit. On February 25, 1972, Telex's motion to consolidate was argued before the JPML.

F5. On March 15, 1972, while its motion for consolidation was pending before the JPML, Telex filed a second complaint in the Northern District of Oklahoma (Action No. 72-C-89) alleging that IBM had violated Section 2 of the Sherman Act (15 U. S. C. § 2) by announcing its "Fixed Term Plan" in May of 1971 and its "Extended Term Plan" on March 1, 1972. Telex sought a temporary restraining order and preliminary injunction

1. The *Greyhound* case was transferred to the United States District Court for the District of Arizona for trial. On July 10, 1972, IBM's motion for a directed verdict was granted at the end of the presentation of Greyhound's case. Judge Craig's opinion granting IBM's motion is reported at 1972 TRADE CASES ¶ 74,205 (D. Ariz.), — F. Supp. —. The *Control Data* case was subsequently settled and on January 15, 1973, Control Data's complaint was dismissed.

from the Oklahoma court. On April 19, 1972, the JPML issued orders transferring the Telex actions to the Minnesota court, *Telex Corp. v. International Business Machines, Inc.* [1972 TRADE CASES ¶ 73,935], 342 F. Supp. 200 (1972), and Honorable Philip Neville, United States District Judge for the District of Minnesota, was assigned to handle complicated discovery and other matters preliminary to trials. Under his able supervision millions of documents were discovered or exchanged and photographed, and various procedural rulings made. On June 12, 1972, Telex filed a supplement to its complaint, alleging violations of the antitrust laws by IBM in the then soon-to-be-announced IBM System 370/168 and 370/158 central processing units (CPU) with integrated CPU memory and integrated disk control circuitry and a lower priced incremental memory. Telex sought injunctive relief preventing IBM from integrating any memory or disk control circuitry into its System 370 central processing units and from lowering its prices for memory incremental to the CPU memory.

F6. On July 21, 1972, in partial response to a motion by Telex, the Minnesota court granted a temporary restraining order enjoining IBM from making any announcement of its 370/168 and 370/158 central processing units until the Minnesota court's decision on Telex's pending motion for preliminary injunction was entered [1972 TRADE CASES ¶ 74,183]. IBM sought relief from the Minnesota court's action in the Court of Appeals for the Eight Circuit (Docket No. 72-1447) both by way of appeal and extraordinary writ. That court on July 28, 1972, determined that the temporary restraining order entered by the Minnesota court was tantamount to the issuance of a preliminary injunction because it exceeded the ten day limitation set forth in Fed. R. Civ. P. 65(b). *The Telex Corporation v. International Business Corporation* [1972 TRADE CASES ¶ 74,184], 464 F. 2d 1025 (8th Cir. 1972). It was ordered that the preliminary injunction be dissolved because the district court had made no findings relative to

the ultimate probable success of Telex on the merits or on Telex's claim of irreparable injury. On July 28, 1972, Telex moved for a second temporary restraining order to be limited to ten days. That motion was denied on August 1, 1972. On October 6, 1972, the Minnesota court, after the submission of affidavits, evidentiary appendices and briefs, denied Telex's motion for a preliminary injunction as well as IBM's motion for summary judgment [1972 TRADE CASES ¶ 74,199]. After extensive pre-trial discovery on both sides in the Minnesota proceedings, Telex finally amended its complaint on January 2, 1973, to demand damages in the amount of $416,100,000, trebled, and on January 8, 1973, filed an amended consolidated complaint.

F7. Telex moved on January 9, 1973, that its cases be remanded to the Northern District of Oklahoma for trial. On January 10, 1973, the case was assigned to this Judge for final pre-trial preparation and trial. Telex's remand motion was granted on January 15, 1973, and as of that date, subject to the Minnesota district court's retention of jurisdiction on certain privilege issues, which have now been finally resolved, this court obtained jurisdiction of these proceedings. On January 22, 1973, IBM answered Telex's amended consolidated complaint and filed two counterclaims—one alleging unfair competition and theft of IBM trade secrets, and the second alleging Telex's infringement of IBM copyrighted manuals.

F8. Pre-trial conferences were held before this court on February 20, March 30, and April 13, 1973. At the final pre-trial conference a jury, previously demanded on both complaints and the counterclaims, was waived by both sides. This court entered a final pre-trial order, based largely upon the March 30 conference, on April 12, 1973, which enumerated in detail the contentions of the parties, stipulated and disputed factual matters, the documentary evidence intended to be offered, and the witnesses to be called by the respective parties.

F9. Trial commenced on April 16, 1973, and the record was closed on May 24, 1973, after 29 days devoted to the taking of evidence. The expedition of the case consistent with full, fair and vigorous presentations was due in important measure to the ability, organizational talent, diligence and experience of counsel, together with the routine informal conferences held each morning before the convening of court among court and counsel where evidentiary problems were anticipated, presented and explored and the management of proceedings was otherwise charted from day to day. A brief post-trial conference was held on May 25, 1973. The parties submitted their separate proposed findings of fact and conclusions of law in compliance with the request of the court, and on June 18 and 19, 1973, oral arguments were had. Whereupon the case was submitted for decision and by the court was taken under advisement. On September 17, 1973, findings of fact, conclusions of law and judgment and degree were filed. On October 16-18, 1973, timely post-judgment motions for correction and amendment thereof were argued to the court and submitted for decision on supplemental briefs.

The Court, now deeming itself fully advised, makes the following amended Findings of Fact in addition to the statement of the case and proceedings set out above, and the minute stipulated facts not set out, including but not limited to the (i) Stipulation of Background Facts Concerning the Electronic Data Processing Industry, the Products, the Industry, the Parties and the Issues, dated March 23, 1973, (ii) Stipulation of Fact No. 2, dated April 12, 1973, (iii) Stipulation of Fact No. 3, dated April 7, 1973, and (iv) Defendant's Exhibit 1662 (an exhibit compiling plaintiffs' admissions introduced at trial), but incorporated herein by reference since there is no contest with respect to them.

I

The Parties

F10. International Business Machines Corporation (IBM) was incorporated on February 24, 1924, and maintains its principal place of business in a state other than the State of Oklahoma where plaintiffs are incorporated and maintain their principal places of business. Before its entry into the electronic data processing (EDP) industry, IBM manufactured punched card accounting machines and other products. In addition to its EDP business, IBM develops, manufactures and markets other business machines including copiers, dictating equipment, and electric typewriters. IBM has been deeply involved in the phenomenal growth of the electronic data processing industry since almost the beginning of the industry. IBM's first EDP system offered for sale was the IBM 701. The first IBM 701 was completed in April of 1953 and was intended primarily for scientific work in connection with nuclear research. The first IBM computer intended for commercial work was the IBM 702, which was installed in early 1955.

F11. The Telex Corporation was incorporated in February, 1963. It is the successor to Telex, Inc., which was incorporated in May, 1940. Since at least 1959 Telex has been manufacturing products which have been used by electronics data processing equipment manufacturers as part of their equipment.

F12. Because of the success of IBM's System 360, certain companies such as Telex entered into the marketing of devices functionally equivalent to IBM devices. The devices marketed by Telex and others plugged into and replaced parts of the System 360. In 1966 Telex began to market replacements for the magnetic tape devices which were part of IBM's System 360 computers. Before the receipt of a contract with DuPont to replace DuPont's installed second-generation IBM magnetic tape devices, Telex had been conducting engineering development work to modify the Telex Model M3000—a magnetic tape drive then being marketed by Telex to other EDP equipment manufacturers—to provide an appropriate electronic interface to attach to an IBM

central processing unit (CPU). An interface is a shared boundary between electronic data processing machines, or more accurately between the channels or physical pathways connecting those machines, through which data or programs may be transmitted, received, stored or processed. After receipt of the DuPont contract, the work was completed and the equipment delivered in August, 1966. The Telex-developed machine was designed with an electronic interface to work in conjunction with an IBM CPU. It was designated as Telex's Model 4700. In late 1966, additional 4700's were installed at Lockheed Aircraft and at Electronic Business Service (AMI). The total engineering cost for designing the electronic interface necessary to adapt Telex's tape drive for use with IBM equipment was $42,000.

F13. In May, 1969, Telex began to market replacements for IBM's disk drives. Telex does not manufacture but purchases the disk drives and disk drive controllers from another company. In November, 1970, Telex announced that it would begin marketing a printer and a printer controller. The printer mechanism is not manufactured by Telex but is purchased from Control Data Corporation. Telex manufactures some of the printer electronics and the printer controller. In November, 1971, Telex announced it would offer a replacement for the memory or main storage used with certain IBM systems. In November, 1971, Telex announced a 6360 memory for attachment to IBM Systems 370/155 and 370/165. That memory was first delivered in November of 1972. Telex purchases the parts of the memories from various corporations. It assembles the parts and markets the final product. As of January 26, 1973, Telex had installed two memories. In November, 1971, Telex announced a 6345 memory for attachment to an IBM System 370/145. Telex has not yet delivered any 6345 memories. Telex has recently advertised its intention to announce a memory for attachment to IBM systems 370/168 and 370/158. Telex's forecast for first customer delivery for these products is the fourth quarter of 1973.

F14. Telex has never announced or delivered a "communications controller" but is presently developing a plug compatible communication controller equivalent to IBM's 3705. Telex has negotiated an agreement with Hitachi, a Japanese corporation, under which Telex will engage in a joint development effort to develop a CPU compatible with IBM's System 370 and competitive with System 370 Models 135 and 145. No final decision has yet been made as to the actual manufacturing and marketing of such a product.

F15. In the aspect of its business relating to the marketing of EDP products to IBM end-users, Telex in the past has had a company policy generally of following IBM's product leadership and subordinating any technological product innovation. Telex products are designed as the functional equivalent of previously announced IBM products, except for whatever technological advances Telex is able to introduce because of the later announcements of its products. Telex's plug compatible tape drives, disk drives and printers have had better performance in some respects than IBM's corresponding products.

F16. Since entering the EDP industry and up to 1971, Telex reported a phenomenal growth in revenues. Its revenues from EDP products and services sold to customers within the United States as reported in the "census"[2] rose from $870,000 in fiscal 1967 to $56,840,000 in fiscal 1971.

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2. The "census" refers to the responses of 1786 companies to Rule 31 depositions upon written questions ordered taken by the United States District Court for the District of Minnesota for the purpose of obtaining information concerning the EDP industry. The depositions were taken in pre-trial discovery proceedings relating to several cases, including *Telex v. IBM,* which had been consolidated in the Minnesota court with *Control Data Corporation v. IBM,* Civil Action No. 3-68-312. Rule 31 depositions were sent to approximately 3300 companies and about 2700 responses were received. About a thousand responses were eliminated either because the companies responding were very small or because the answers were not responsive or were otherwise not susceptible to recordation. This census is in evidence.

II

The Industry

F17. The electronic data processing (EDP) industry is a young and dynamic one ranking high in importance among the industries of the nation. The first commercially built EDP system—the Univac I—was delivered in 1951 to the Bureau of the Census. The demand for EDP products and services as indicated by the revenue of companies responding to the court census has grown from $48 million in 1952 to $10.2 billion in 1970.

F18. Electronic data processing is employed by government and major producers of goods and services throughout the country to make their operations more efficient and to provide new and better products and services. The scientific community has used and is continuing increasingly to use electronic data processing extensively. The kinds and types of available products, equipment or services used are determined by the applications for which there is a need and the available resources to meet the need. Examples of electronic data processing applications are almost as numerous as business and scientific applications: The computer can keep track of enormous numbers of people who have made reservations with the various airlines and tell passenger reservation agents when planes are full. EDP systems control many manufacturing processes and almost entire factories, monitor patients with severe heart disease in hospitals, and control some navigational systems on airplanes. Such systems are used in printing newspapers, controlling traffic lights, guiding ships, navigating and controlling space missions, and even in designing other computers. Less dramatic but widespread are day by day business applications affecting the lives and fortunes of almost every individual in the country in one way or another. There has been a marked increase in the sophistication of EDP customers in the last few years. Immediate purchasers of EDP products and services are most often large institutions such as the United States government,

universities, or large industrial organizations. Most of the EDP systems are installed in the five hundred largest governmental and business organizations. Many professional consultants offer assistance in the design of EDP systems and the procurement of EDP products and services, thus enabling smaller users to make more knowledgeable decisions concerning their EDP needs.

F19. Dramatically increasing demands for EDP products and services and the needs of EDP users have resulted in a rapid growth in the number of companies which offer EDP products and services and in a variety of products and services which are offered to accomplish the data processing needs of users. Many different kinds of companies have been attracted to the EDP industry. The number of companies responding to the census and reporting EDP revenue in each year from 1952 to 1970 has grown from 13 to 1773, a growth in number of more than 136 times in eighteen years. According to the census, the number of companies which manufacture and market a complete EDP system has grown from 3 in 1952 to 96 in 1972, but only 8 or 9 of these companies are considered in the trade as principal systems manufacturers. These include IBM, Univac (Sperry Rand), Burroughs, Control Data Corp., General Electric, Honeywell, RCA, XDS (Xerox), NCR, and Digital Equipment Corporation (DEC). Recently RCA and GE have gone out of the systems business. The products and systems formerly manufactured and marketed by RCA and GE remain in the market and are now being maintained, serviced and remarketed by Honeywell and Sperry Rand. As a result Honeywell and Sperry Rand probably have been strengthened and their ability to compete with IBM enhanced by their acquisition of the computer operations of RCA and GE.

F20. Spurred additionally by the success of IBM's System 360, manufacturers of certain peripheral devices began in 1966 to market to end-users products which were functionally equivalent to certain IBM System 360 devices. The equipment of these companies "replaced" IBM devices and utilized all the system's support and services provided by IBM. In 1966 Telex, and shortly thereafter other independent manufacturers, began manufacturing and operating magnetic tape drives which were functionally equivalent to IBM magnetic tape drives and which could be "plugged" into, and thus were "plug compatible" to IBM central processing units. The end-user customer of an IBM computer system then had the option to use an IBM tape drive or to use one made by a "plug compatible manufacturer" (PCM). Peripheral equipment manufacturers have expanded their peripheral product lines, moved into the leasing of complete EDP systems, and certain of those companies, including Telex, Memorex and Mohawk Data Sciences, are now expanding, or considering expanding, into the manufacture and marketing of their own central processing units.

F21. In the mid-1960's leasing companies began purchasing computer products from IBM, which they then leased to computer end-users. These companies purchased $2.6 billion worth of IBM's 360 computer hardware for which IBM received its full retail price and corresponding profit. Leasing companies typically purchase an installed IBM computer system and then lease it to the existing end-user at a rate less than IBM charges for its identical products. When an initial lease ends and the machine leaves the first end-user's shop, the leasing company owner remarkets the "used" equipment when possible. During the late 1960's a substantial quantity of the initial leases relating to the $2.6 billion worth of IBM 360 computer equipment mentioned above were expiring and during the late 1960's and early 1970's leasing companies were engaged in remarketing that EDP equipment. Another type of leasing company transaction involves the purchase of plug compatible tape and disk drives from PCM's after they are installed and on rent in an end-user's location. This type of transaction is primarily a method of financing and the leasing company depends upon the manufacturer to market and service the product.

F22. A service bureau owns or leases computer products and/or services and then performs data processing services for customers for a fee. The customer can get data processed by this method without owning or leasing any specific EDP "hardware" or "software". A time-sharing company is one that installs a terminal facility in the customer's business location; the terminal is connected to the time-sharing company's computer system via telephone communication lines. The end-user can then time-share the computer system by means of the remote terminal for a fee. A data center is an establishment having a computer installation which permits customer personnel to operate the computer equipment for a fee. Software houses prepare and market computer programs or instructions designed to cause the central processor and peripheral products to perform their required functions. Examples are instructions that will cause data from input devices to be transferred to storage devices, to be retrieved when needed, then processed in a usable form. Facilities management companies, or system engineering consultants, such as Computer Usage Corporation, provide the customer with systems engineering and design services as well as services for the actual operation of the end-user's computer facilities.

F23. The speed, reliability and capacity of computer products have increased greatly since 1952. One of IBM's CPU's, the 370/168 (announced but as yet undelivered) when compared to the Univac I will have 700 times the storage capacity of Univac I, and it will execute additions 4,300 times faster, multiplication 3,100 times faster, and division 2,000 times faster. The data transfer rate of current tape drives is 40 times greater than that of the earliest tape drives used with the Univac I. Memory technology has increased cycle speed of main memory devices a thousandfold since 1952. Electronic circuitry improvement permits products to be made today which were difficult to conceive a few years ago. Speed, capacity and reliability have improved, while power requirements have dropped.

III

The Nature of Electronic Data Processing

F24. Electronic data processing (EDP) is the conversion of words, letters, numbers or combinations of words, letters and numbers, or other types of data, into electronical signals; the data is then collected, stored, sorted, analyzed, compared or computed. The "hardware" products and "software" programs that perform these functions are often referred to collectively as a computer system, or simply as a computer. Computing may involve both simple and complicated calculations, or the storing and sorting of large amounts of data. An example of the complicated calculations of computers is the work done at the Manned Spacecraft Center which links computer systems throughout the United States to computers on board spacecrafts to perform large numbers of precise, complicated calculations. An example of storing, sorting and comparing large amounts of information is an airlines passenger reservation system, or a warehouse inventory system.

F25. An EDP system consists of products which perform five basic functions. These are "processing", "storage", "input", "output" and "control". Input is the entering of data into storage. The input devices convert data from an "ordinary" language form (i.e., English and numbers) to "machine" language or electronic signals which are then understandable to a computer. Output is the opposite. Output devices convert the "machine" language or electronic signals to the output form desired, such as printed or typed in humanly understandable language on paper, recorded on magnetic tape or magnetic disk, punched as a hole in a punched card, or displayed on a television-like screen. Output devices can also be used to open or close a valve, or to transfer electrical impulses to another computer system. Storage of data is accomplished in either the main memory or some type of auxiliary storage.

F26. Main memory is the storage from which data are transferred to the processor and to which data are returned in their processed form. Auxiliary storage is the storage from which data

are interchanged with the main memory for processing, temporary transfer, or more permanent storage. Auxiliary storage is usually accomplished in some one or more of the following: Large core storage (LCS), data cells, magnetic drums, magnetic disk devices, magnetic tape devices, paper tape devices and punch cards. The type of auxiliary storage used is dependent upon the applications and needs of the customer with reference to the stored data.

F27. The processing function is the computation or performance of logical operations. These logical operations involve additions, subtractions, and comparisons. The logic is composed of simple steps done rapidly to achieve the ultimate results. A control function enables a computer system to perform a large number of consecutive instructions. The control function can usually understand or evaluate the various operations as they are concluded and perform alternate operations without human intervention based upon such evaluation. The control function directs and coordinates the operation of the various products making up the system and can be performed by a combination of hardware, microprogramming and software. Programs are sequences of instructions which tell the various devices what to do. Programs are also referred to as software.

F28. A modern computer system is composed of a variety of individual devices each of which usually performs a different function that may be needed to perform a particular needed application. The user may select from various products the particular combination of individual devices and software which will solve the customer's data handling needs, taking into consideration the economics and applications involved. The user's choice of alternative devices may depend upon trade-offs among price, capacity, speed, flexibility, space requirements, and the number, kind and priority of applications to be performed and users to be serviced, but inherent are various limitations of function and application

which as a practical matter most often dictate a particular device for a particular application.

F29. Individual input/output products include teletype machines, typewriter terminals, television-like displays which use cathode ray tubes, card punches and punched card readers, magnetic tape drives and magnetic disk drives. There are also devices which read magnetic characters or optical characters such as those on checks, and there are devices which read coded tags on merchandise. When used in stores, these devices automatically record the sale, bill the customer, and remind the store to reorder.

F30. Printers perform an output function. Like a typewriter terminal, a printer converts electrical signals into printed characters and numbers. Printers, however, operate at much higher speeds than typewriter terminals. Mechanical impact printers operate at up to 2,000 lines per minute while electrostatic printers, which operate similar to copying machines, can operate at higher rates. There are special purpose printers used to produce graphs, charts, drawings and maps. Other output devices produce microfilm. These are called computer output microfilm, or COM, devices.

F31. Products which perform a storage function include magnetic core arrays, semiconductor circuitry, magnetic tape drives, magnetic strip files, magnetic drums, and magnetic disk drives. All these devices, except the semiconductor circuitry, store data by converting electrical signals into a magnetized recording that can be reconverted into electronic signals. A magnetic recording is permanent in that it remains when electric power is "off", but the semiconductor circuit loses its stored data when the electric power is "off".

F32. The CPU is generally where most of the logical functions or calculations are performed. Controllers, channels, peripheral processors and multiplexors are smaller processors designed for a particular use, and when used permit a more efficient use to be

made of the central processor by speeding up interchanges of data and making preliminary or intermediate computations for relay to the CPU.

F33. EDP products are built from electronic and electromechanical components. The components include electronic circuits, devices for converting electrical impulses to magnetic, devices for converting magnetic impulses to electrical, devices for converting electrical current to mechanical movement, as well as cables, connectors, metal frames and various power and cooling elements. The most numerous physical parts of an EDP system are the electronic circuits. Electricity, as used in a computer, essentially has only two states or conditions—it is either "on" or "off" as is the case of an electric light. By combining electronic switches which are on or off, computing can be done if "on" equals 1 and "off" equals 0. Different combinations and sequences of 1's and 0's then can be used to represent all numbers and all letters. When electronic data processing began, each electronic circuit was made up of a vacuum tube, such as is used in radio or television, plus wires and resistors. The development of transistors in the 1950's allowed the vacuum tubes to be replaced by transistors.

F34. IBM was an early user of the transistor in its EDP systems. IBM built its own factories to make transistors. The use of transistors made possible the reduction of size, cost and power requirements of an EDP system and increased reliability and speed. This allowed the construction of EDP systems of greater capacity and operational speed and expanded the number and types of applications for which such equipment could be used. As work continued on the refinement of the transistor at places like Bell Laboratories, Texas Instruments, Motorola, Fairchild, and IBM, ways were found to combine the various components making up an electronic circuit into a single chip, which is now about ⅛ inch square. This chip is called an "integrated circuit". In the 1960's, IBM as well as others began to build EDP systems using

integrated circuits. This allowed a further reduction in size, a further increase in reliability, a further increase in speed and a further reduction in cost. Work at IBM and other places has led to the continual miniaturization of the circuits. It became possible to produce multiple circuits on a chip. This was referred to first as "medium-scale integration" and later, as the number of circuits increased, "large-scale integration". In the latest EDP equipment, components are in use which have more than two thousand circuits on a single silicon chip ⅛ inch square. Under development in IBM and other laboratories are chips containing 16,000 circuits. Moreover, there are under development processes which, it is believed, will produce chips with 64,000 circuits or more.

IV

Relevant Market

F35. In determining whether there is monopoly power to control prices or exclude competitors in any part or line of commerce, the court is required to consider a relevant market or markets within which such determination can be made. Manifestly, the electronic data processing market in general is one relevant to such an inquiry. But the fact that monopoly power may not exist on the part of any company within that general market as a whole does not end but only begins the inquiry in this case. It should also be noted that we are not primarily concerned with prior or subsequent years, but that in view of the issues of this case a determination must be made as to the relevant market or markets in the period 1969-1972, timing also being an important element here because of the youth and dynamics of the market and its various developmental stages over the years. It is recognized that a purely transitory condition could be so brief or insubstantial as to be *de minimis* or immaterial in appraising market power; but it must also be recognized that in a real sense every market condition may be temporary in the perspective of historical

development, and yet the policy of the antitrust laws does not permit the unlawful application of monopoly power against competition to its damage over a substantial period even though, if competitors could hang on for a time, technological or other developments might change the competitive situation for the better.

F36. Telex asserts that in the period mentioned IBM possessed monopoly market power in the general systems (CPU) "relevant market", in the market for peripheral devices plug compatible with IBM CPU's, and in the "relevant submarkets" for magnetic tape products, direct access storage products, memory products, impact printer products, and communication controllers that were plug compatible with an IBM CPU. IBM claims that it had no monopoly power in any such general markets and that submarkets did not exist because competition in the EDP industry was primarily on a systems basis, and that the relevant market consisted of EDP systems and the products which make up such systems and the companies which provide alternatives to such systems. IBM further claims that even if one were to limit the focus to particular parts of a system, such as peripherals, the relevant market must include all peripheral products, not just those currently attached to IBM systems. It is further contended by IBM that once the decision is reached that the relevant market should include peripherals attached to competitive systems, as well as those attached to IBM systems, it does not make any difference with respect to IBM's share whether the market is limited to such peripherals or is broadened to include all products which make up systems. IBM further claims that even if "plug compatible" tapes, disks, printers, communications controllers, and memories did constitute separate submarkets, if the decision were made to include disks or any of the other products attached to known IBM systems, as well as those attached to other than IBM systems, IBM's share of each of these submarkets would be well below the level that would support any inference of market power.

F37. The potential general market toward which the efforts of both companies seem directed, with the progressive broadening of Telex's base and the technological and industrial developments in prospect, appears substantially the same, and the real issue is whether that market may be realistically subdivided in the time frame 1969-1972 to focus on and encompass only those parts of current product lines which are respectively attached to IBM systems, rather than all those products which actually have similar uses in connection with other systems; although, with respect to the claimed *attempt* to monopolize, these distinctions may not be critical. By definition every manufacturer has 100% of its own product. Thus, where a hopeful competitor first offers a product as a substitute for the original, the originator typically will continue to have a large share of that product. So, likewise, in the EDP industry each manufacturer of systems normally has a large percentage of the peripheral equipment which is part of its system. By this token a systems manufacturer has 100% of the peripherals attached to its new system until someone begins to copy some or all of these peripherals or designs others to take their place on a plug compatible basis. It is an oversimplification to say, however, that under Telex's market definition theory, as soon as someone begins (or perhaps even plans or thinks about) copying a part of a new system, as IBM argues, the manufacturer of that system becomes a monopolist and has an obligation not to cut prices or do anything else that might reduce the profitablity of the copier. The record in this case shows that peripheral devices attached to IBM equipment but manufactured or supplied by others during the relevant period have grown into, and have been recognized as, a significant, distinct and important part of the EDP industry. Again, for the particular period mentioned, we are not dealing with mere theory but with a historic, economic fact, transitory or otherwise. The question persists, however, whether such suggested subdivisions of the industry can properly be regarded as relevant

markets or submarkets within which economic power can be separately appraised. A related dilemma must be avoided by at once precluding the unreasonable fragmentations of markets[3] and preventing the monopolization of separately competitive components while a whole industry is thus subverted part by part.

F38. Peripheral products constitute an important part of a data processing system, accounting for 50-75% of the price of the system. Such products are critical to the performance of the system as a whole. It cannot be gainsaid that indirectly at least and to some degree the peripheral products attached to non-IBM systems necessarily compete with and constrain IBM's power with respect to peripherals attached to IBM systems. The quality and price/performance of the peripherals attached to a system are a substantial factor in a customer's choice between competing systems, and if for example IBM failed to improve the price/performance of its peripherals, customers might choose systems (including peripherals) of other systems manufacturers. For example, the IBM Merlin (3330) disk drive was believed by IBM to be a critical factor to the competitive price/performance of the 370 systems 135, 145, 155, 158, 165 and 168. The 3330 was therefore announced in June of 1970 at a price/performance designed to make IBM more competitive with both systems manufacturers and peripheral equipment manufacturers. The Court finds that the document entitled "Listing of Manufacturers of Plug Compatible Products, The Products Offered and the Systems Manufacturers for Whose Systems the Products are Offered" (attached to "IBM's

3. IBM states: "Obviously a finding that the relevant market could be as narrow as suggested by plaintiffs would have broad implications for IBM, for the EDP industry generally and perhaps for many other businesses as well. Indeed, if Telex has a good claim against IBM it should have an even better claim against Univac who's acquired RCA CPU's, Telex's tape drives attached through Formation controllers. Such a broad and novel impact suggests that the reasoning that leads to such a result may be faulty; indicating that the appropriate market must be broader than plaintiffs contend."

Response to Some of Telex's Proposed Findings of Fact and Conclusions of Law Relating to Telex's Antitrust Claims" dated June 15, 1973) is a summary of the details there stated. Peripheral pricing and product announcements of one systems supplier influence subsequent peripheral pricing and product announcements of other systems suppliers, although it may be difficult to identify any given competitive price cut or product improvement as a reaction to a single competitive act. Many companies, including Telex, which manufacture or market peripheral equipment for attachment to IBM CPU's also manufacture or market equipment for attachment to non-IBM CPU's, but to a substantially lesser extent. Moreover, suppliers of peripherals plug compatible with non-IBM systems could in various instances shift to the production of IBM plug compatible peripherals, and vice versa, should the economic rewards in the realities of the market become sufficiently attractive and if predatory practices of others did not dissuade them. In the absence of defensive tactics on the part of manufacturers of CPU's, the cost of developing an interface for a peripheral device would generally be about the same regardless of the system to which it would be attached, and such cost has not constituted a substantial portion of the development cost of the peripheral device.

F39. In this extraordinary industry dominated as it has been by IBM's influence, neither theoretical relationships nor technological similarities supply the full answer to the relevant market problem. In the realities of the marketplace, as recognized and acted upon by IBM as well as by the plaintiffs and their customers, it must be determined (a) whether plaintiffs' concept of relevant markets keyed peculiarly to devices plug compatible with IBM CPU's is sound, and (b) whether there is sufficient demand or supply interchangeability, substitutability or flexibility as to render indistinct or ineffectual the lines dividing the submarkets relied upon by plaintiffs as among themselves or as between them and

general EDP systems. A differentiation between the IBM plug compatible peripheral market in general and submarkets involving particular types of such peripherals seems not so critical, since it appears likely that IBM's market power would not significantly vary as between them.

F40. IBM and other systems manufacturers design, develop, manufacture and market systems solutions to data processing problems on a systems basis primarily, although with respect to particular applications the suitability of particular peripheral equipment may be emphasized. In designing a system, IBM and other systems manufacturers must design the boxes comprising the system, the configuration of boxes in the system to provide the best solution to a particular set of requirements, the system software essential or helpful for the operation of the hardware generally, and the particular applications software to perform the customer's special applications. The reliability and predictability of the system involve the hardware, software and the personnel maintaining and operating the system. There are significant expenses involved in designing systems so that the various boxes can be integrated into different configurations and combinations. There are a number of other systems development costs not easily identifiable because of difficulty in segregating an engineer's time between developing a particular unit and working on its integration into a system. Similarly, systems marketing costs are hard to define because of the difficulty of separating the time a salesman spends configuring a system from his other activities. Particularly with respect to new customers, systems manufacturers offer a substantial amount of EDP education, which is essential in order to market systems. Systems development and marketing costs are allocated across all of IBM's products and are included in the pricing of those products. Some customers can perform completely their own systems integration work in view of the level of sophistication among them, but others rely upon IBM or other systems suppliers to do this work and to provide systems control

programs. Telex and other peripheral manufacturers do not incur substantial systems development and systems marketing costs in connection with their plug compatible business, nor could they market their products for attachment to IBM systems without IBM system software to which is devoted about 30% of IBM's annual development cost. Thus there are practical and logical difficulties in severing the peripheral market from the systems market.

F41. It is true also as a generalization that to a substantial degree each of the different functions of a system can be and is performed by a variety of devices and that users not infrequently can choose among different devices which make up an EDP system on the basis of price/performance and the particular applications desired. This interchangeability, however, is between particular peripheral devices for particular applications, and in and of itself does not render particular devices a necessary part of a systems market. Rather, it raises the question whether all or a portion of the peripheral devices are a part of the market for peripheral devices. Merely because there are alternate ways of storing data in an EDP system, each of which competes to a degree with others in various applications, does not mean that it is appropriate to consider storage products such as tapes, disks and memories and their substitutes as a part of the systems market rather than part of a peripheral device market.

F42. Devices which perform a storage or memory function include core arrays, semiconductor circuitry, magnetic tape drives, magnetic strip files, magnetic drums, and magnetic disk drives. Each of these devices has a different operational speed and a different cost and, depending upon the needs and budget of the user, each can be used in structuring the computer in different ways to a limited extent. Constrained by particular applications, needs and objectives, these devices compete with one another in a limited sense and in some applications users can employ different devices

interchangeably. An EDP user might "trade off", for example, the higher performance of memory for the lower price of disks in certain applications, whereas for other applications disks and tapes could perform similar functions and be used interchangeably. A user might trade off the higher performance of magnetic disks or drums for the lower price of magnetic tapes on some applications, and in general, but still in a limited sense, users may have price/performance alternatives or trade-offs among disk drives, memory, tape drives, the tape library, the vault, the disk pack, etc. in configuring any total EDP system. In a limited sense, too, certain storage devices such as memory are interchangeable with the CPU itself, users choosing between larger or faster CPU's with relatively small amounts of memory and smaller or slower CPU's with relatively large amounts of memory; and in certain instances CPU's function as peripheral devices, and peripheral devices or parts of peripheral devices have similarity to CPU's. Terminals which perform input and output functions also have processing functions, storage functions and control functions. Intelligent terminals perform processing functions otherwise performed by communications controllers or central processing units. Most magnetic core storage, magnetic tape drives, magnetic disk drives and magnetic drums contain some processing control functions. Printers, like Telex's 5848, can also perform processing storage functions with a controller and magnetic tape drives.

F43. The users also choose between terminals, printers and computer output microfilm devices as various means of accomplishing an output function depending upon the various needs and applications involved. Special kinds of printers, called plotters, can be used to produce graphs, charts or drawings, and even maps. Other types of printers called computer output microfilm (COM) devices produce microfilm. A teletype is one kind of slow speed printer. Other kinds of printers include drum printers, which can be slow or high speed (from 300 to over 1000 lines per minute), chain printers and train printers. Less expensive slow speed printers are alternatives to more expensive higher speed printers. Terminals are also used to perform output functions. Electrical signals are converted into words and numbers on a display screen or typed on a roll of paper. Many terminals also have processing functions, storage functions and control functions. Computer output microfilm may be a direct competitor to printers because of relative hardware costs as well as cost of paper versus cost of microfilm, and some customers have replaced or are replacing printers with COM equipment on a price/performance basis.

F44. An essential element of any electronic data processing system is the control function. In large portion the control function is performed by software or programming. The cost of developing operating system software is substantial and competition in the supply of better operating systems necessarily affects the price a manufacturer can charge for its EDP systems. But it is true only in the superficial sense that software can be used as a direct substitute for hardware, although cost of certain hardware or the extent of its necessity may be affected by the software.

F45. Some suppliers of peripheral devices can and do become suppliers of systems and the suppliers of full systems can and do supply peripheral devices plug compatible to the CPU's of other manufacturers in some instances. Suppliers of peripheral devices, including Telex, either have planned or are considering movement to full systems. Texas Instruments, which began as a supplier of components for EDP and other electronic purposes, now markets the world's fastest CPU, and Memorex, which began as a supplier of peripheral devices, announced two full EDP systems in 1972. Suppliers of full systems, including IBM, can and in some instances do provide peripheral devices for use with the systems of other manufacturers either directly to end-users or to other system manufacturers. Manufacturers of CPU's and peripherals use to a substantial degree the same technology, making it technologically practical, given time, funds and personnel, to switch from one to

the other. In the long range this potential "supply substitutability" has had and will have substantial effect upon the development of the market and upon trends of competition, but during the period with which we are concerned supply substitutability was a minimal factor in the marketplace as a constraint upon pricing. It was a fact of economic life in the industry that new technological developments and new entries into the market were continuing, but the primary factor which governed the pricing of peripherals for entrance into the peripheral market was the demand elasticity or the substitutability of immediately available products in connection with the needs and applications of users.

F46. Computer equipment is different than used automobiles because when properly maintained such equipment generally performs as well today as it did when new, subject to repair and subject to obsolescence through technological advances. Various end-users view leasing companies as a competitive alternative and in many instances may substitute leasing company equipment for installed IBM equipment. Telex itself leases full systems to users, including IBM CPU's, and purchases certain peripheral equipment from other manufacturers and remarkets it to end-users. Service bureaus, time-sharing companies and data centers are also used by customers to a degree as alternatives to acquiring new or additional EDP systems. An EDP user may obtain his own equipment, may have his data processing done by establishments such as service bureaus, data centers and time sharing companies, or he may purchase time from another user. Some EDP end-users consider service bureaus, data centers and time purchased from other users as practical alternatives to acquiring new equipment. But with respect to peripheral equipment to be added to or integrated with IBM CPU systems, these alternatives have not provided substantial constraints on IBM's product and pricing decisions.

F47. Systems manufacturers offer central processing units and peripheral products which are electronically compatible to each

other. The peripheral products designed to be compatible with one manufacturer's central processing unit are not interchangeable or attachable to the central processing units of another manufacturer without modification of their interfaces. As a practical matter, there is no direct or box-for-box competition between IBM's peripherals and the peripherals of other systems manufacturers, and in order to replace IBM peripherals with the peripherals of another system manufacturer, the user must first replace his IBM central processing unit. The only box for box peripheral competition of any substantiality has been and is between IBM and the plug compatible manufacturers (PCM's). IBM's Systems competitors were not directly affected by IBM's pricing and product actions for peripherals and made no competitive price responses to IBM's 2319A and B and Fixed Term Plan (FTP) price reductions for its peripheral products. After FTP, IBM's Systems competitors were not mentioned in any of IBM's FTP tracking documents as having cut or reduced their price for any of their products. Time sharing companies, service bureaus, and data centers were not directly affected by IBM's price and product actions for peripherals, and after 2319A and B and FTP made little if any competitive pricing responses to IBM's peripheral price reductions.

F48. IBM markets its product by both lease and sale. All sales to end-users or leasing companies are at IBM's full retail price. IBM determines its retail sale prices by establishing a monthly rental multiple for the product that is equivalent to the number of months of rent that IBM reasonably expects to receive for that product. The rental-sale multiple for each machine may be different—based on the estimate of product life. When IBM is paid the full economic value of a product sold, it expects the product to be used for its full product life. Peripheral products separately leased by other companies or by IBM are not numerous, and leasing companies most generally lease systems or a combination of peripherals and CPU's. There is a substantial amount of IBM equip-

ment owned by leasing companies. The pricing of leasing companies is constrained or affected by IBM's pricing policies, which may neutralize to an extent the competitive effect of leasing company activities as to IBM pricing.

F49. The court has not been unmindful of these and other circumstances and arguments pressed upon it by IBM in attempted demonstration that since its predatory acts or market power have not been proved in respect to the EDP industry or the systems market as a whole, it cannot be vulnerable to a charge of monopoly by reason of the interrelationship among components of the industry. Some practical considerations among other more imponderable ones militate against such a theory: (1) The pattern for a divide and conquer strategy of monopoly which its acceptance would permit and foster, and (2) in the realities of the market and of competitive conduct, neither IBM, its competitors nor the public have experienced difficulty in subdividing the EDP industry into markets roughly equivalent to the classification contended for by plaintiffs. IBM recognized as early as 1964 that a separate and distinct market for input/output peripheral products that were plug compatible to IBM central processing units was developing. For several years IBM studied possible market and product actions which would minimize potential entry of new competitors into that market. Plug compatible manufacturers have been defined in IBM internal documents as "those manufacturers which merely have to plug IBM hardware to be operable".

F50. In late 1969 "peripherals" were designated as a "key corporate strategic issue"—("KCSI")—by IBM's management committee. The key peripherals issue was limited to selected competitive compatible products which replaced IBM products in an IBM computer system. In IBM's internal processing and study of this issue "competitive compatible products" were described as "system attached input/output and memory products" including "magnetic tape drives and control units—direct access storage

products and control units—impact printers and control units." Memory products were both "main" and "large capacity storage". Excluded were central processing units, consoles, paper tape products, communication products and control units, information display products and control units. RPQ's and non-standard products, and non-system attached products. The objective of designating peripherals as a KCSI was to assess the factors affecting both current and future competitive compatible peripheral products; to review IBM strategies, policies and practices so as to identify exposure areas; and to recommend actions to reduce or eliminate such exposures. These plug compatible products were treated by IBM for competitive studies, strategies and other purposes as separate economic entities. And, particularly, IBM recognized for said purposes central processing units, memory products, consoles, paper tape products and control units, communication controllers and related communication products, magnetic tape products and control units, direct access disk drives and subsystems, and impact printers and control units, as separate economic entities. This separate consideration and treatment no doubt is ascribable in part to convenience of record keeping, comparison of data, effectiveness of evaluation and such factors, but with reference to memory products, magnetic tape products and control units, direct access disk drives and subsystems and impact printers and control units, in view of the competition of other marketers furnishing devices plug compatible to IBM machines, such suppliers, IBM and the industry in general came to regard these lines especially as representing separate economic entities as a result, and for the purpose, of actual competition in the marketplace.

F51. IBM's 2319A-B product and marketing actions hereinafter discussed affected and were intended to affect directly only one type of product, its 2314 type equipment, and were particularly intended to reduce profits for Telex and Memorex on this type of product. The only IBM products forecasted by it to be protected

by IBM's Fixed Term Plan (FTP) was IBM's tape, disk, and printer products. The only competitive products forecasted by IBM to be affected by FTP were plug compatible manufacturers' tape, disk and printer products. When, as here, predatory action is selective and focused, and its anticompetitive effects are similarly shunted away from a more general market, corresponding submarkets should be more readily recognized. IBM has made the persuasive argument that a market concept based on the idea that every manufacturer has a monopoly in each of the components of its product is too sweeping, and necessarily flawed, the flaw being "the disregard of economic forces operating in the markets where manufacturers compete." With such a generalization there can be large agreement. But the critical flaw in application to the circumstances of this case, it seems to me, would be created by ignoring the separate market and submarkets within which IBM waged its predatory competitive battles and which became and were thereby made separate competitive entities in the marketplace and within which monopoly power existed and was exercised.

F52. The court finds that the peripheral devices plug compatible with the CPU's of IBM may be considered the relevant market for the purposes of this case, and that relevant submarkets existed for plug compatible tapes, disks, memories and printers with their respective controllers, and communications controllers.

F53. CPU's are not reasonably includable within this market and these submarkets, nor are software as such, but the peripheral equipment plug compatible to IBM CPU's which are separately leased by leasing companies to end-users are. Alternate sources of computer time such as service bureaus, time-sharing companies, data centers, users selling excess time and the like are not reasonably includable in the relevant market or submarkets with which we are concerned in this case, since their competitive relationships are tangential and indirect, and do not supply a real or substantial competitive force in the relevant markets mentioned. It is true

that a large part of the competition in the industry takes place on a systems basis, but the relationship of this competition to the relevant markets with which we are concerned again is tangential and practically indiscernible. Certainly in another context the competition between systems manufacturers would constitute, or be a part of, a relevant market, but such relevant market is not material under the facts of this case since the competition involved here is not between systems manufacturers but between IBM and plug compatible manufacturers and suppliers.

F54. Nor do the alternate ways of storing data in an EDP system justify the commingling or combination of submarkets. The evidence indicates that objectives and applications are the controlling factors in the use of alternatives and not necessarily price. While in special instances price may have affected particular selections as between alternatives, the applications and objectives of an operation have dictated not only the selection but the price/performance ratio itself in most instances. It is more theoretical than real to say that interchangeability of use or demand as between tapes and disk storage, for instance, precludes the consideration of these submarkets separately. Nor do the trade-offs possible as between the higher performance of memory for the lower price of disks avoid these practical consequences. It is true that if memory were less expensive the user might extend the use of memories for the storage function rather than to utilize disks to the extent he does. This does not obviate the competitive reality that as between disk drives and memories a valid submarket boundary line exists. The reality of this situation appears to be that despite some theoretical interchangeability, a rise in the price of one storage device will cause a substantial number of customers to turn to similar devices less expensive rather than to use fewer of such devices and more of other types of devices. It is true, also, that to some extent certain storage devices, such as memories, are interchangeable with CPU's themselves, and that users can and

do choose between larger or faster CPU's with relatively small amounts of memory and smaller or slower CPU's with relatively large amounts of memory. In the realities of the market place this, however, has not critically affected the competition between suppliers of memory or disk products compatible with IBM CPU's, nor does the circumstance of theoretical interchangeability mean that both CPU's and memory belong in the same relevant market.

F55. The foregoing determinations have been made, it is believed, with due regard for the authorities concerning interchangeability of use, cross-elasticity of demand and supply substitutability, and defendant's arguments based thereon. Mere theoretical cross-elasticity without substantial impact in the marketplace in relationship to demand/price has not been deemed determinative. For every product economic substitutes exist. To be included in the same market it is not sufficient that a few customers would shift from one product if its price, relative to the price of another, were raised. On the other hand, it of course is not necessary that products be identical. "Supply substitutability" may not be disregarded. Manufacturers who have existing technological capabilities or tooling to supply reasonably interchangeable products may effectively restrain the power of those in the market to raise prices, but the evaluation of whether this is so, again, is dependent not upon mere theory but upon the reality if any of the effect of the potential in the marketplace. While the potential need not necessarily be an immediate one, it must not be so remote as to have no actual influence on the competitive situation. A relevant market cannot be enlarged by theoretical speculation as to future market conditions or potential substitutability having no substantial effect upon competition during a period in question. I find that neither cross-elasticity or interchangeability of use or demand, nor substitutability of supply, critcically militates against the relevant market

and submarket definitions within which IBM's market power will now be assessed.

V

Market Power

F56. Monopoly power is the economic ability to charge unreasonably high prices and to exclude competition. Proof of the actual use of such power for these purposes is not essential to a finding of its existence but would be an important factor in any assessment of market power. The strength of competitors is relevant to an assessment of market power. Monopoly power presupposes the power to control what happens in a relevant market. Ease of entry may be an indication of lack of market power on the part of an alleged monopolist. Difficulty in entering, weakness of competing companies and dependence of competitors upon dominant forces in the market are among indicia of market control on the part of an alleged monopolist. Necessity of competitors to react to price changes by the alleged monopolist, particularly above or below a scale based upon self-determined reasonable cost and profit may be important. If the percentage of a relevant market controlled by an alleged monopolist is high an inference of market power may be drawn. When its control is moderate no inference of market control may be permissible. In case of a medium range, it may be impossible to infer or to rule out monopoly, so that factors other than market percentage must be looked to primarily. Where there is direct credible evidence of market domination or predatory practices which are productive of control in a particular relevant market, inferences need not be depended upon but this more direct evidence may be determinative. Other factors to be considered are any necessity on the part of an alleged monopolist to meet competition in technology and pricing, the equality of performance in the industry and its comparative youth, growth and dynamics or change. Claimed necessity of responding to competi-

tive influences beyond the control of the alleged monopolist may be only its excuse for anticompetitive conduct for the purpose of maintaining or extending monopoly power or to surmount threatened competition, and monopoly is possible in a young, dynamic and complex industry as well as in an old or static one, and may be even more feasible in special cases through masking of selective market strategies in the overall technological developments. Sophistication of users or competitors may discourage monopoly but equal or greater sophistication on the part of an alleged monopolist may be a counter-balancing factor, and industry dynamics may continue in evidence through technological momentum beyond the inception of monopoly. While these and other criteria and their limitations have been considered, it is recognized that the question of monopoly control is one of fact to be determined on the whole record and not susceptible of being resolved by any mechanical applications.

F57. By their arguments and proposed findings, plaintiffs would have the court find that in the period 1969 to 1972 IBM possessed monopoly market power in a general systems relevant market as well as in the more limited relevant plug compatible market and the submarkets for magnetic tape products, direct access storage products, memory products, impact printer products, and communication controllers that are plug compatible with an IBM central processing unit. Little or no evidence was introduced in these cases that IBM evidenced an intent to monopolize, or directed efforts toward monopolization of the EDP systems market in general, except through its more focused conduct. Presumably plaintiffs now do not wish to rest their case entirely upon their plug compatible market theory, or at least consider that the dominant position of IBM in the general market supports, or lends substance, to its claims that IBM monopolized or attempted to monopolize the plug compatible market or submarkets. On the other hand, the position of IBM in the general market lends increased force to its arguments concerning its declining market share, the dynamics of the industry, the strength of competitors, and other factors tending to negate a monopoly position. While it is believed that the position of IBM in the general EDP industry, particularly with reference to general systems, is relevant, the evidence is insufficient for a finding, and it is unnecessary in the court's view to find in order properly to resolve this case, that IBM during the revelant period monopolized or attempted to monopolize the general systems market.

F58. There is no question but that IBM occupied, and continues to occupy, an important position in the systems market. In 1970 revenues reported from electronic data processing products and services according to the census, IBM was the leading company in the industry, with almost $3.5 billion of revenue. AT&T which is not a systems manufacturer was next largest in terms of EDP revenue, $759,435,000. Of the next three largest companies, Univac (Sperry Rand), Honeywell and Control Data, none had EDP revenues in excess of $460 million. Internal IBM documents containing measurements of IBM's share of the domestic market for systems and peripherals place IBM's market share progressively decreasing from 75.9% in December, 1964, to 73.3% in September, 1968, and IBM's market share of central processing units (CPU's) progressively decreasing from 68.6% in 1964, to 64.4% in 1968.

F59. Defining the market broadly, as IBM claims it should be, competitors include many large diversified companies with important skills and substantial financial resources, and many competitors are strong, independent and growing. Entry into such a broad market has not proved difficult for many companies. Between 1952 and 1970 the number of competitors in the EDP industry multiplied more than 136 times, from 13 to 1773, according to the census. The total United States EDP revenue has increased about 212 times from $48 million in 1952 to $10.2

billion in 1970. Many companies, in addition to IBM, have shown spectacular growth, although none to the extent IBM has. The number of companies which manufactured systems increased from 3 in 1952 to 96 in 1972. IBM's technology, and its organization and diligence in advancing it, have been of high quality, contributing in a substantial degree to IBM's general success in the industry. There is little or no indication in the evidence introduced in this case that IBM adopted specific programs to throttle or impede general systems competition or that it sought to implement any predatory intent with respect to the EDP industry as a whole, as distinguished from efforts directed specifically against the marketers of peripheral equipment plug compatible to its CPU's.

F60. Generally speaking, EDP customers have been furnished with progressively better products at progressively lower prices. Memory capacity has increased by a factor of approximately 700 from the Univac I to the IBM 370/168. Performance of the CPU as measured in the execution of additions, multiplications and divisions per second has increased by a factor of over 4300, 3100, and 2000, respectively, from the Univac I to the IBM 370/168. The fourth generation 370/168 costs only a little less than seven times as much as the first generation Univac I. The performance of tape drives as measured by the transfer of characters per second has increased by a factor of 46 from the tape drive used with Univac I to the tape drive used with the 370/168 for an approximately 1⅔ price increase. There has been a 16-fold increase in storage capacity as well. From the first to the fourth generation, there has been a 13 times performance improvement in printers for less than 3 times the price increase. There has been a 37 times performance improvement and a 20% drop in price in disk files from the first to the fourth generation. The requirements of electronic data processing users, and the profusion of companies attempting to fill those needs, have led to a marked increase in the performance of products and significant decrease in the cost per

unit of computing. Broadly defined the EDP industry appears competitive and dynamic.

F61. IBM's market share of the EDP industry as a whole or the general systems (CPU) market does not of itself justify an inference of monopoly power in the market as so broadly defined, or at least as to this plaintiffs have not discharged their burden of proof to show monopoly power as a part of their monopoly complaint: According to the census, IBM's 1970 share of reported EDP revenue for hardware and leasing companies over $5 million, 42.3%; its 1970 share of reported EPD revenue for hardware companies over $5 million, 44.9%; its 1970 share of reported EDP product revenue, 44.5%. IBM's share of the value of 1971 shipments of "electronic computers and peripheral equipment, except parts", according to the U. S. Bureau of the Census, was 36.7%. IBM's share of the value of 1971 shipments of "Electronic Computers, Digital, General Purpose", according to the U. S. Bureau of the Census, was 40.9%. IBM's share of the value of 1971 shipments of "direct access storage units such as magnetic tapes and drum, magnetic cord and bulk core memory", according to the U. S. Bureau of the Census, was 30.4%. Its share of the value of 1971 shipments of "serial access auxiliary storage units such as magnetic tape units", according to the U. S. Bureau of the Census, was 45.6%; its share of the value of 1971 shipments of printers, according to the U. S. Bureau of the Census, was 38.3%. These shares have been declining. IBM's share of reported EDP revenues has declined from 64.1% in 1952, to 35.1% in 1970, and there have been comparable declines in others of the categories above-mentioned.

F62. The figures on market share particularly with reference to plug compatible peripherals are not readily available from published sources, nor can they be extrapolated or inferred from census data dealing with peripheral products in general, some of which have been cited above. But the defendant, in the processing

of its marketing strategy and planning, developed an organization and system well designed to segregate these data, since its studies were directed specifically to the narrower markets. Accordingly, while the court has considered the general data available, and inferences reasonably to be drawn therefrom, it has seemed fair and appropriate to afford considerable weight to data available from defendant's studies, and it has.

F63. The inception of a related market was natural because of the dominance IBM products commanded in the marketplace and the feasibility of furnishing functional equivalents to some of these products which could be rendered plug compatible with IBM CPU's. The devices marketed by Telex and others plugged into and replaced parts of the System 360 family, and ultimately parts of the 370 family were replaced. Notwithstanding some difficulties of rendering interfaces compatible, and developing the personnel and technology to design and manufacture or otherwise secure equivalent devices, entry was initially easy for peripheral equipment manufacturers because they could choose to copy only proven successful products. Moreover, they could utilize in many instances systems hardware provided by the system manufacturer and typically would sell only after all systems engineering, systems marketing, side preparation and systems installation work had been completed. The number of companies supplying peripheral equipment plug compatible with IBM systems grew from 2 or 3 in 1966 to some 100 today. A number of these handled only one type of device and few if any had the variety of peripheral devices plug compatible to IBM CPU's that Telex had. The relatively large number of companies in time engaged in the plug compatible business did not represent a corresponding dispersal of the business, since the major share during the developing years was concentrated within a matter of a dozen plug compatible manufacturers (PCM).

F64. Of course, with respect to the IBM peripherals later replaced by plug compatible devices of other manufacturers, IBM initially had 100% of the market. But as the plug compatible business developed on the part of other manufacturers or suppliers, IBM's market share was substantially eroded, and in due course it became a concerned competitor for peripheral devices to be attached to its own systems. Starting in 1968 there was a very rapid growth in the quantity of equipment shipped by peripheral equipment manufacturers which was plug compatible with IBM CPU's. This occurred first with tape drives in 1968 and then with disk drives in 1969 and this plug compatible growth continued into and perhaps through 1970, and became in itself an important and recognized market which increasingly was enlisting new participants and inviting plans for further expansion.

F65. The increase in plug compatible business and the decrease in IBM's share of the plug compatible market must be evaluated in light of the foregoing circumstances and the fact that it was not until 1970 that IBM's strategic and tactical responses to the inroads of the plug compatible manufacturers became really effective. The apparent vitality of the plug compatible market and the increase in the number of companies engaging therein accordingly cannot be considered as necessarily negating the monopoly power or predatory intent of IBM, since as far as the evidence discloses IBM did not really begin the exercise of whatever market power it had as against plug compatible equipment manufacturers until the period 1969-1970. It also is relevant to note that any increase in competitive entries into the market in 1972 and 1973 could well have been affected by the institution of the present litigation in early 1972, and, for prospective entrants, at least some possibility which pending litigation to obtain remedial action may have held out.

F66. The testimony of Bonham and the Bonham charts indicate in accordance with the census that in 1970 IBM received

revenues of $1,137,819,000, from its plug compatible peripheral products, and all other manufacturers of IBM plug compatible products together received slightly in excess of $100 million in revenues; that in 1970 IBM had 90% of the revenues from tapes attached to IBM CPU's and PCM's had 10% of the revenues; that in 1970 IBM had 68% of revenues received from disk drives attached to IBM CPU's and PCM's had 32%; that in 1970 IBM received 99.6% of all revenues for memory products attached to IBM CPU's and that PCM's had the remaining .4% of memory revenues; that in 1970 IBM received 92.3% of revenues from communication controllers attached to IBM CPU's and that the PGM's had 7.7% of such revenues.

F67. IBM's internal documents indicated that in 1970 IBM had 80% of tapes (units) attached to IBM CPU's, and that PCM's had 13%; that in 1970 IBM had 94% of disk drives (units) attached to IBM CPU's, and that PCM's had 6%; that in 1970-71 IBM had 99% of the market for impact printers attached to IBM CPU's; that Telex was an entrant in the high speed impact plug compatible printer market with a potential market share of 8.5% for PCM's, and 91.5% for IBM by 1978; that Telex and a number of other companies were potential entrants into the plug compatible memory market, and that the total number of units of magnetic tape devices (240X-2420-3420 type) and disk drive products (2311-2314/2319's-3330 type) attached to IBM central processing units as of December, 1970, June, 1971, and December, 1971, June, 1972, and December, 1972 (both the PCM's and IBM's share including all devices marketed by them whether leased or sold) were as follows:

Tape Drives—204X-2420-3240 Type
Totals Installed on IBM CPU's

	12/70 Units	%	6/71 Units	%	12/71 Units	%	6/72 Units	%	12/72 Units	%
IBM	36,726	89.8	35,742	86.3	36,403	86.0	37,944	86.1	39,670	85.1
PCM	4,169	10.2	5,668	13.7	5,931	14.0	6,116	13.9	6,952	14.9
Total	40,895		41,410		42,334		44,060		46,622	

Disk Drives—2311-2314/2319-3330 Type
Totals Installed on IBM CPU's

	12/70 Units	%	6/71 Units	%	12/71 Units	%	6/72 Units	%	12/72 Units	%
IBM	65,686	93.2	63,574	85.5	65,941	84.2	66,622	82.7	68,002	82.5
PCM	4,833	6.8	10,748	14.5	12,402	15.8	13,967	17.3	14,445	17.5
Total	70,519		74,322		78,343		80,589		82,447	

The following four charts accurately reflect the information set forth. In the following four charts the figures following "user owned" and "leasing company" refer to devices initially manufactured by IBM. In the preceding chart the devices listed under "IBM" include IBM manufactured devices whether owned by IBM, owned by end-users or owned by leasing companies:

Third Generation 240X and 2420 Type
Tape Drives for IBM S[illegible]ns
Units & Percentage

	12/70	6/71	12/71	6/72	12/72
240X Type					
IBM Owned	20182(59.8)	18045(55.4)	15859(52.3)	10771(43.6)	5996(30.7)
User Owned	3900(11.6)	4058(12.4)	4369(14.4)	4656(18.8)	5035(25.8)
Leasing Company	5554(16.5)	5563(17.1)	5405(17.8)	5236(21.2)	4911(25.1)
Peripheral Company	4088(12.1)	4919(15.1)	4705(15.5)	4059(16.4)	3602(18.4)
Total	33724	32587	30338	24722	19544
2420 Type					
IBM Ownad	6744(94.1)	7695(87.2)	7319(82.0)	3698(67.7)	1290(43.5)
User Owned	304(4.2)	332(3.8)	344(3.9)	367(6.7)	384(13.0)
Leasing Company	42(0.6)	46(0.5)	46(0.5)	38(0.7)	26(0.9)
Peripheral Company	81(1.1)	749(8.5)	1216(13.6)	1361(24.9)	1263(42.6)
Total	7171	8822	8925	5464	2963
Total 240X-2420 Type Tapes					
IBM Owned	26926(65.8)	25740(62.2)	23178(59.0)	14469(47.9)	7286(32.4)
User Owned	4204(10.3)	4390(10.6)	4713(12.0)	5023(16.6)	5419(24.1)
Leasing Company	5596(13.7)	5611(13.5)	5451(13.9)	5274(17.5)	4937(21.9)
Peripheral Company	4169(10.2)	5668(13.7)	5921(15.1)	5420(18.0)	4865(21.6)
Total	40895	41409	39263	30186	22507

3420 Type Tape Drives for IBM Systems
Units & Percentage

	12/70	6/71	12/71	6/72	12/72
IBM Owned	0	0	2937(95.7)	12845(92.6)	20990(87.4)
User Owned-IBM	0	1(100)	124(4.0)	320(2.3)	881(3.7)
Leasing Company-IBM	0	0	0	13(0.1)	57(0.2)
Peripheral Company	0	0	10(0.3)	696(5.0)	2067(8.7)
Total	0	1	3071	13874	24015

Third Generation, 2311/2314/2319 Type
Disk Spindles for IBM Systems
Units and Percentage

	12/70	6/71	12/71	6/72	12/72
2311 Type					
IBM Owned	10712(51.4)	8196(43.7)	6464(38.0)	5343(33.5)	4326(29.0)
User Owned	3426(16.5)	3507(18.6)	3662(21.5)	3838(24.1)	4016(26.9)
Leasing Company	4497(21.6)	4499(24.0)	4348(25.5)	4200(26.3)	4035(27.1)
Peripheral Company	2194(10.5)	2569(13.7)	2576(15.0)	2572(16.1)	2536(17.0)
Total	20829	18771	17050	15953	14913
2314/2319 Type					
IBM Owned	33991(66.4)	32552(58.6)	33865(57.5)	30656(53.3)	27066(49.4)
User Owned	7009(14.1)	7709(13.9)	8124(13.8)	8493(14.7)	9326(17.0)
Leasing Company	7051(14.2)	7109(12.8)	7135(12.1)	7018(12.2)	6595(12.0)
Peripheral Company	2639(5.3)	8179(14.7)	9826(16.6)	11395(19.8)	11824(21.6)
Total	49690	55549	58950	57562	54811
Total 2311 and 2314/2319 Type Spindles					
IBM Owned	43703(62.0)	40748(54.8)	40329(53.1)	35999(49.0)	31392(45.0)
User Owned	10435(14.8)	11216(15.1)	11786(15.5)	12331(16.8)	13342(19.1)
Leasing Company	11548(16.4)	11608(15.6)	11483(15.1)	11218(15.2)	10630(15.3)
Peripheral Company	4833(6.8)	10748(14.5)	12402(16.3)	13967(19.0)	14360(20.6)
Total	70519	74320	76000	73515	69724

3330 Type Disk Spindles for IBM Systems
Units and Percentage

	12/70	6/71	12/71	6/72	12/72
IBM Owned	0	0	2400(86.1)	6412(90.6)	11518(90.5)
User Owned-IBM	0	2(100)	374(13.4)	606(8.6)	972(7.6)
Leasing Company-IBM	0	0	14(0.5)	56(0.8)	148(1.2)
Peripheral Company	0	0	0	0	85(0.7)
Total	0	2	2788	7074	12723

F68. The Bonham charts on which some of plaintiffs' contentions with reference to market share are based cannot be taken at face value and must be evaluated with reference to related circumstances as shown by the evidence. For example, only revenues from the principal or dominant PCM's in the market are included in some of the charts; revenues from leasing companies which acquired IBM plug compatible memory devices and disk devices from IBM and marketed them in competition with IBM were excluded and the figures were not updated to indicate a probable continuing decline of certain IBM market shares during the period 1971-72. Weighing these and other factors, and particularly testing the charts as against the internal documents of IBM with reference to its shares of the relevant submarkets, it is fair to say that they support a finding that IBM's share of the relevant submarkets or the combined submarkets comprehended in the general market classification "peripheral equipment plug compatible to IBM", is such as to permit an inference of monopoly power on the part of IBM, and the court so finds.

F69. IBM's internal documents generated in connection with competitive studies looking toward management decisions to meet the competition of plug compatible manufacturers have been deprecatingly referred to in argument by the defendant as being the products of non-management employees, or as grossly underestimating competition. It seems appropriate to note here, however, and for later reference in connection with the predatory conduct of IBM, that most of the studies were made by highly trained and qualified IBM personnel acting within an organization justly noted for its perception and responsiveness to market conditions, and with technological standards and aids likely superior to most great companies of the United States. There were some uncertainties in the precise sources of some data coming to the attention of management, and some combinations of documents in the evidence did not represent the precise form in which they

were submitted to management. Yet the inputs into management with reference to competitive and market situations, the testing and processing by management of these inputs and its rather consistent acceptance of their bases in any management outputs, indicate to me, by and large, in view of all the circumstantial evidence in the case that IBM's internal documents represent significant evidence not only as to market shares but as to the intent and purpose of the defendant. They were prepared for submission to management in the course of the business of a highly competent and effective organization at a time when we can assume that their litigious significance was not distorting. They were represented by forecasts, chart presentations, tables, and similar documents and were generated with specific reference to the competitive situation involving the plug compatible market at the time, and their relationship to top management decision under all the circumstances may be readily perceived in most critical instances.

F70. On the basis of all of this testimony with reference to market shares, inferences that may be reasonably drawable therefrom, direct testimony as to IBM's domination of the relevant markets and submarkets, and the effect upon competitors in this market and submarkets of its predatory competitive practices, during the period 1969 to 1972, inclusive, I find IBM possessed monopoly market power in the relevant market of peripheral equipment plug compatible to IBM CPU's and in the relevant submarkets for magnetic tape products, direct access storage products, memory products, impact printer products and communication controllers plug compatible with IBM central processing units. The court further finds in this connection that this general market and the submarkets specified above comport to the competitive realities of the period; that by reason of the peculiar development of the EDP industry with the historical domination of IBM in the general systems market, with the

market of plug compatible peripherals growing up, in historical and developmental fact, as a separate competitive entity along with its submarkets, the separate reality of this market along with its submarkets cannot be dismissed or ignored as a mere example of a manufacturer necessarily having a monopoly of its own product. The court further finds that whether the submarkets hereinabove defined be considered separately and severally or whether they be combined into the market for peripheral EDP equipment plug compatible with IBM CPU's, monopoly power during all periods material herein was possessed and exercised by the defendant IBM.

VI

IBM's Practices and Intent

F71. IBM's top management became concerned in the summer of 1969 that IBM forecasts with regard to plug compatible competition were understated. This concern was intensified in January of 1970 when IBM learned that the Bureau of the Budget intended to encourage federal agencies to use equivalent lower cost peripheral equipment compatible with CPU's supplied by IBM and by other systems manufacturers and suggested the utilization of standard interfaces.

F72. By 1970, some plug compatible devices offered in the tape and disk areas by PCM's were, in fact, functionally superior to, and were regarded by IBM as superior to, their corresponding IBM products. The Telex 4700, 4800 and 5420 model tape drives were, in fact, superior and were regarded by IBM as superior products to the IBM equivalent tape drives Models 729, 2401 and 2420. Telex's 5311 and 5314 disk drives were in fact superior, and were regarded by IBM as superior to IBM's equivalent 2311 and 2314 disk drives. Product superiority was achieved by Telex because these products were first delivered substantially later than the IBM products. The Telex 5314 and the Telex 5328 which is the controller for the Telex 5314 were purchased from Itel and

were developed for Itel by a group of 12 former IBM personnel. The following table shows when IBM first announced and delivered the products and when Telex first announced and delivered the products it intended to replace the IBM product:

Chronology of Product Introductions

Telex Product	*Telex Announcement Date*	*Telex First Customer Shipment*	*IBM Product*	*IBM Announcement Date*	*IBM First Customer Shipment*
4700 Tape Drive	May 1966	Aug. 1966	729 Tape Drive	Jan. 1957	Aug. 1958
4800 Tape Drive	July 1967	Mar. 1968	2401 Tape Drive	Apr. 1964	May 1965
5311 Disk Drive	May 1969	Aug. 1969	2311 Disk Drive	Apr. 1964	Feb. 1965
5314 Disk Drive and Controller	May 1969	Apr. 1970	2314 Disk Drive and Controller	Apr. 1965	Mar. 1967
5420 (Mod 7) Tape Drive	May 1970	Dec. 1970	2420 (Mod 7) Tape Drive	Jan. 1968	Dec. 1968
5240 (Mod 5) Tape Drive	Aug. 1970	Feb. 1971	2420 (Mod 5) Tape Drive	Dec. 1968	Oct. 1969
6420/6803 Tape Drive and Controller	Dec. 1970	Nov. 1971	3420/3803 Tape Drive and Controller	Nov. 1970	Sept. 1971
5403/5821 Printer and Controller	Nov. 1970	Aug. 1971	1403N1/2821 Printer and Controller	Apr. 1964	June 1965
6360 Memory	Nov. 1971	Nov. 1972	3360 Memory	June 1970	Feb. 1971
6330/6830 Disk Drive and Controller	Nov. 1971	Oct. 1972	3330/3830 Disk Drive and Controller	June 1970	Aug. 1971
6345 Memory	Nov. 1971	Not yet delivered	3345 Memory	Sept. 1970	Nov. 1971
6721 Printer System	Aug. 1972	Not yet delivered	1403N1/ (Mod 2) Printer and Controller	Apr. 1964	June 1965

F73. In response to the increasing competition IBM was receiving from plug compatible manufacturers marketing some functionally superior peripheral devices in the tape and disk areas, IBM's Management Committee, in February of 1970, designated peripherals as a "Key Corporate Strategic Issue" (KCSI). To be so designated was a management device to deal with an issue that had broad implications and required the attention of its top corporate management.

F74. After the designation of peripherals as KCSI, a task force was formed in March of 1970 to be headed by H. E. Cooley, Vice President of the Systems Development Division. The Peripheral Task Force or Cooley Task Force, as it became known,

met regularly both in formal and informal meetings from the middle of March of 1970 until its report to the Management Committee of IBM on July 31, 1970. The objective of this task force was to examine the competitive threat to IBM of plug compatible suppliers. A Telex trial witness, Richard Whitcomb, who was IBM's manager of I/O Systems Marketing from the fall of 1968 to the summer of 1971, participated in the work of the Peripheral or Cooley Task Force on behalf of the Data Processing Division. A purpose of the Peripheral Task Force was to study and recommend plans and product strategies to impede the growth of IBM's plug compatible competition. The Peripheral Task Force made in-depth analyses of various plans and strategies each having as a signficant purpose the containment and retardation of the growth of IBM plug compatible competitors. The task force made in-depth assessments of the status of plug compatible competition and analyzed the viability of particular plug compatible competitors, including Telex.

F75. In the summer of 1970, IBM's top management believed that plug compatible competition was one of IBM's major business problems. And the "Mallard" project was the first concrete response to this problem. The Mallard disk file was announced by IBM as the 2319A disk storage facility for the Model 145 System 370 on September 23, 1970. The 2319A was a reworked 2313 disk drive with one of the spindles removed. IBM removed one of the four disk drives from the 2313 box (IBM's four spindle 2314 type disk drive box) and put in some of the control function electronics from the 2314 controller. The control function on the 2319A for the 145 was handled by integrated file adapter (IFA) that was placed underneath the covers of IBM's System 370/145, together with the portion moved into the disk file cabinet. The user had the option of using the 2314 subsystem attached directly to the channel instead of the internal IFA. The software

programming support for the operating system was identical in each configuration.

F76. The 145 end-user who elected to use a 2314 controller, a 2312 and a 2318 for a three spindle configuration, instead of the IFA and 2319A, was charged the higher 2314 prices for the same identical function. In short, if the user did not choose the IFA and 2319 he received no price reduction for the disk drives utilized on the 145. The end-user who selected the IFA/2319 disk drive subsystem for the 145 saved $1,325 per month on a three spindle configuration. The $333 per spindle price represented a $103 per month reduction per spindle below IBM's price per spindle for its 2313 four drive configuration. IBM's monthly rental per spindle for the 2319A was $100 per month lower than Telex's then current price per spindle for Telex's equivalent drive; and, was less than the price then being offered by IBM's plug compatible competitors. The monthly rental adopted by IBM for the 2319A was the lowest rental profile considered by its management prior to the announcement. The price level announced was forecast by IBM to have maximum impact on IBM's plug compatible competitors. Prior to the 145 announcement, IBM considered raising the rental price of the 145 CPU to offset the revenue reduction that would result from the reduction associated with the IFA/2319 when compared to the 2314 control unit with the 2312/2318 attached.

F77. The 2319A disk subsystem did not substantially increase the performance of the 2314 subsystem. The end-user customer received similar functional performance by utilizing a three spindle 2319 box with the IFA as he did by utilizing a 2314 subsystem. The data rate, the access rate, and the data capacity per spindle were the same. IBM's price cuts for the 2319A and IFA were not justified upon the basis of reduced manufacturing costs.

F78. IBM may have reduced its costs somewhat through reuse of 2314's which were being returned to IBM because of plug compatible competition, but it is clear from the evidence that any decreased cost was of minor importance or influence in the Mallard plan and that price reduction independent of cost on limited products in competition with plug compatible suppliers was the primary purpose of the response. IBM camouflaged the 2319A price cut as a "new" product for the purpose of avoiding a general price reduction to all its installed 2314 subsystems which would have reduced IBM's revenue stream of $514 million a year on its installed disk base by approximately $120 million per year.

F79. The 2319A price cut was designed by IBM specifically to contain plug compatible competition. It originated in the Cooley or Peripheral Task Force and was approved by top management. Its primary purpose was to maintain control of the plug compatible disk market for IBM. It was introduced by IBM with the specific purpose and intent of suppressing plug compatible disk competition. IBM admits, indeed argues, that its action was a competitive response necessitated by the inroads of plug compatible competition and that it in fact did not succeed in maintaining IBM's market share. But IBM already possessed a dominant market share, and continues to do so. Notwithstanding lawful acquisition theretofore, its intent to maintain its monopoly by unlawful predatory conduct cannot be equated reasonably with an ordinary competitive response.

F80. IBM, in October, 1970, organized a second Peripheral Task Force to analyze plug compatible competitors in the disk drive area. The scope of the task force study included analyzing of the marketing, management, maintenance, production and engineering capability of IBM's plug compatible competitors. The group was directed to study and estimate the announcement and first customer shipment dates on PCM's 3330 equivalents and make a cash flow analysis, including financing arrangements, of PCM's, to make an estimate of the PCM's 2314 manufacturing cost and to determine "how long can OEM PC suppliers go on

2314 prices?" This group's report concerning Telex concluded that Telex was viable, that its management was competent and aggressive and that it had a strategy of marketing a full line of high volume IBM plug compatible peripherals, that its in-house engineering capability was good, but that its manufacturing costs were 10% to 15% above IBM's. The Telex analysis concluded that Telex's cash flow was inadequate to permit Telex to finance its own lease base and that Telex's key exposure was "impact by IBM—shortens product life".

F81. Prior to a further announcement involving the 2319 IBM had concluded that Memorex and Telex were the two most signficant plug compatible competitors for 2314 type disk drives. Telex witness Whitcomb in his role as IBM's I/O Marketing Manager attended a presentation by Telex's deposition witness, Fassig, on Memorex and Telex in the fall of 1970. Fassig's presentation was an analysis of the impact on Memorex and Telex of various price cuts by IBM on 2314 drives, the corresponding price reactions that Memorex and Telex would be forced to make, and the effect upon their viability. Fassig's analysis demonstrated that as IBM would cut the price in the 2314 area, and Memorex and Telex would respond, there would be a very serious impact on the profits and revenues of both Memorex and Telex. By October 20, 1970, IBM's Management Review Committee was considering extending the 2319 program to the System 360 and the elimination of IBM's extra use charge on disk drives. On December 10, 1970, the Management Review Committee approved the "2319B" announcement.

F82. IBM announced the 2319B on December 14, 1970. The 2319B was a single box containing three 2314 disk drives. The 2319 did not attach to an IFA but attached to IBM's 2314 control unit. In conjunction with the 2314 control unit the 2319 could be utilized on all IBM Systems 360 and 370 computers to form a disk subsystem of three, six or nine 2314 drives (8 drives plus a spare). The 2319A announcement only permitted the use of one 2319A box with the IFA. The 2319B announcement permitted the use of an additional 2319B box with the 2319A box and the IFA, thus giving the 145 IFA user the option of using the IFA and two 2319 boxes with an additional 2314 box to make up eight drives, or using the 2314/2319B nine drive subsystem.

F83. IBM's rental price on the 2314 control unit utilized with the 2319B remained at $1,480 per month. IBM's rental price on the 2319B was set as $1,000 per month, or $333 per 2314 drive—the same price that had been set by IBM on the 2319A announcement. The monthly rental price on the 2319B represented a substantial price cut for 2314 drives. In a 2319 subsystem consisting of three disk storage units, the 2319 monthly rental price represented a price cut of over $1,000 per month for a 2314 subsystem. In addition, the 2319B announcement eliminated IBM's extra use charge on 2319A, 2319B and 3330 disk drives. The elimination of the extra use charge represented an additional and substantial price reduction. The 2319B announcement was purely a price cut. The 2319 did not even purport to represent any increase in performance in a 2314 subsystem. This price cut was to a point below the prices IBM's plug compatible competitors were charging for their plug compatible equivalent 2314 drives. IBM's price cut on the 2319B announcement cut the price of the nine 2314 drives used in a 2314/2319 subsystem approximately $700 below the average price of IBM's plug compatible competition and $800 below Telex's price.

F84. Just after IBM made its 2319B announcement IBM had an installed base of 47,051 lease and purchase 2314 spindles, as compared to an installed base of 2,639 2314 equivalent type spindles for all of its plug compatible competition together, and further, IBM had over 94% of all disk drives installed with IBM CPU's. IBM's forecasts and analyses with respect to the adoption of the 2319B program considered IBM's competition with plug

compatible manufacturers. None of the IBM forecasts and analyses with regard to the adoption of the 2319B program was expressed or geared in any way toward competition between IBM and systems manufacturers, leasing companies, software and consulting organizations or service organizations. The 2319B was designed by IBM as a predatory action contrived to maintain its 94% control of the plug compatible disk market.

F85. IBM's 2319B price cut substantially impacted its plug compatible competitors' revenues and profits by reason of responsive price reductions which IBM had anticipated would have to result, but it did not succeed in fully protecting IBM's installed base. As Mr. Evans, then President of IBM's Systems Development Division, testified: "For a month or two after the 2319 was announced, the plug compatible sales leveled off; but then, as I recall, there were pricing actions by the competition, and that curve turned right back upward." Not only did IBM plug compatible competitors lower their prices but the plug compatible competitors had complete modularity (1 drive per box) on their 2314 equivalent drives and by reducing their price per drive they were able to sell between the configurations of IBM's three, six and nine 2319 drive subsystem configuration. (1, 2, 4, 5, 7 and 8 drive configurations.) Mr. Finnell reported to the Management Review Committee in January, 1971, with regard to IBM's 2319B and 3420 pricing actions: "OEM reaction to our recent tape and disk pricing action . . . were as expected or lower. We are continuing to update our 1971 forecasts—raises the question of are you really ahead or are you back to where you started before you adjusted your own prices."

F86. In December, 1970, IBM announced a price reduction for all its disk devices, including the 2314, 2319 and 3330, by eliminating all additional use charges. Immediately after IBM's announcement of the 2319B, Telex negotiated the 28% price reduction from its supplier ISS for the 2314-type devices it was

buying. Telex, other peripheral equipment manufacturers, and some leasing companies dropped their prices for the 2314-type devices to levels substantially under those of IBM. After the decrease in Telex disk device prices the order rate of Telex disk devices again increased significantly. In the period from November, 1970, to December 31, 1972, Telex shipped 1074 more 2314-type disk drives and 191 more 2314-type disk controllers than it had forecasted in November, 1970, that it would ship.

F87. Telex claims that as a follow-up predatory action IBM announced its 3420 or "Aspen" tape device; that Aspen was not planned by IBM until after PCM's started gaining substantial shares of the installed base from magnetic tape products, and that Aspen was a price manipulation which was conceived to reduce the number of drives marketed by plug compatible manufacturers without reducing IBM's revenues from its installed 2420 tape drives. While there is some evidence to support such a theory, the court considers it less than preponderant and finds that the announcement and marketing of Aspen was not predatory and did not represent in and of itself an unlawful attempt to monopolize. The Aspen development began in approximately 1966, and finally incorporated significant technological innovations not found in prior tape devices. The price of the IBM Aspen was based on lower cost when compared to the 2420 and included reasonable profit. Telex announced its equivalent 2420 products almost two years after the announcement of the 2420 Model 5 and has offered insufficient proof as to how in any event it was damaged by the 2420 Model 5. There was no Aspen issue included in the final pre-trial order, but the court has made the foregoing findings against the possibility that it may be contended that such an issue with the acquiescence of the parties was actually tried and considered during the trial.

F88. Telex contends that IBM's announcement of its Fixed Term (leasing) Plan (FTP) in May of 1971 was a predatory act and that similarly IBM's announcement of its Extended Term Plan (ETP) in March of 1972 was a predatory act. Telex also claims that FTP and ETP constituted illegal restraints of trade because they locked out competitors; and a further contention is made that IBM's announcement of a CPU price increase on July 28, 1971, was undertaken specifically for the purpose of recouping the losses occasioned by the introduction of FTP. IBM denies these contentions and alleges that it announced its leasing plans in response to similar plans offered by virtually all IBM's competitors, recognizing that without some form of long term lease it would suffer serious and continuing loss of business to systems manufacturers, leasing companies and peripheral equipment manufacturers, pointing out that it now has three long term lease plans under which it offers most of its EDP equipment. Again, there seems little question but that in a different context, or directed to general competition, the leasing plans adopted by IBM might be unexceptional or entirely justified. The question remains, however, whether in the setting of IBM's dominant position in the plug compatible submarkets and in view of the evidence as to its specifically directed intent and concern with reference to the plug compatible competition in those markets, the two leasing plans above-mentioned can be sustained as against Telex's attack. In view of the fact that most of IBM's systems manufacturer, leasing company and peripheral equipment manufacturer competitors were offering long term leases by the Spring of 1971 (Finding F100), IBM expected to, and was likely to, continue to lose substantial systems and peripheral business unless some plan was adopted.

F89. IBM's 2319B announcement failed to retain IBM's high share of the plug compatible disk market and failed to contain the growth of IBM's plug compatible competition during the first quarter of 1971. The latter continued to make strong advances

with its installations in the 2314 disk area. By February 12 IBM's plug compatible competitors had installed 3,006 2314 equivalent spindles; by March 15, 3,491; and by April 9, 4,614. IBM's plug to plug peripheral competition commenced to proliferate from tapes and disks to printers in the last quarter of 1970. By September, 1970, IBM anticipated that Telex would have a plug to plug compatible printer, and revised its printer forecast. Telex was regarded by IBM as the leading competitor in the plug compatible peripheral marketing area because of its broader product lines, having tapes, disks and printer, and IBM suspected that Telex would soon offer a memory device.

F89a. In 1970 and 1971 IBM experienced the effects of a nationwide recession combined with inflation, which caused a substantial increase in the level of returns and discontinuances of its EDP equipment including peripheral equipment. IBM at that time offered equipment only on short-term leases or for sale; its rental customers could effectively return their equipment to IBM on 30 days' notice. As a result of the economy, many of IBM's rental customers took advantage of this privilege and returned a significant amount of equipment to IBM. IBM's experience was not shared by its leasing company, systems manufacturer or peripheral equipment manufacturer competitors, since their equipment was generally leased for terms of one, two or more years, with termination charges or other costs in the event of cancellation. Another factor affecting IBM's business in this period was the increasingly lower rental prices charged by leasing companies and peripheral equipment manufacturers for equipment similar to IBM's. As a consequence of these factors, IBM's sales force in 1970 achieved only 50% of its selling objective. In 1971, IBM experienced the worst sales record year in its history for EDP equipment.

F90. Mr. Whitcomb prepared an overview study of IBM's plug compatible competition late in the first quarter of 1971. This

overview study was presented to the President of IBM, IBM's Data Processing Division, and IBM's Management Review Committee. It concluded (a) the plug compatible phenomenon was accelerating in volume and scope; (b) the plug compatible competition presented a serious threat to IBM's potential growth since the exposed peripherals represented 63% of IBM's installed lease base; (c) defending against plug compatible competition was difficult because of their pricing and performance advantages; (d) IBM should try to combat peripheral competition by frequent advances in technology utilizing "mid-life kickers" and pricing which would take advantage of IBM's short-lived product lead in the peripheral area including the consideration of long term uses; 13% of IBM's systems were "contaminated" with plug compatible tape or disk equipment and PCM penetration would increase with package selling. Specifically, the Whitcomb study found that IBM would lose 19% of the plug compatible tape market by 1976 and IBM's planned tape program was inadequate and IBM would lose 28.7% of the plug compatible disk market by 1976 and IBM's planned disk program was inadequate. The Whitcomb study also found that IBM should be concerned about the memory and printer areas. While it is clear that IBM expected plug compatible competition to increase in volume and scope by the end of the first quarter 1971, it is also clear that IBM even by its worst case forecast only anticipated loss in the neighborhood of 20 to 25% of tape and disk markets to all of its compatible competition by 1976.

F91. Even after the 2319 price cuts, IBM on in-depth study considered Telex a "viable" competitor that could "manage impressive earnings. . . ." In April, 1971, IBM's Management Review Committee concluded that its control of plug compatible disk and tape drives was being eroded and the printers and memories would be next. IBM determined to deal more effectively with its plug compatible competition. At a Management Review Committee meeting on April 23, 1971, IBM's chief executive officer,

Mr. T. J. Watson, Jr., formulated IBM's basic policy approach. Mr. Watson informed the Data Processing Group that he wanted "a clear understanding that the company swallow whatever financial pills required now and get ready for the future . . . irrespective of financial considerations of one of two years—must return this business to a growth posture and operate accordingly." Mr. Watson stressed the need for IBM "to make the hard decisions today so that the same problems don't have to be faced again and again down the road." IBM's Management Review Committee appointed a task force to develop a new peripheral strategy and specific action programs to deal with plug compatible competition. The task force, although not specifically given that name, was sometimes known within IBM's organization as the "Blue Ribbon Task Force".

F92. On May 6, 1971, this task force made a report to IBM's Management Review Committee (MRC). It recommended drastic tape and disk price cuts to contain IBM's plug compatible competition. Specifically, the task force recommended that IBM reduce its price by 50% on 2314 and 2420 disk and tape drives, by 20% on 3330 disk drives and by 15% on 3420 tape drives. The MRC rejected these recommendations and directed the task force to develop a strategy for memories and printers and to rework "the possibility of a long-term leasing approach as suggested by FTC (Frank T. Cary)." In the ensuing three weeks this task force made a number of iterative reports to IBM's Management Review Committee on long-term leasing of specific peripheral products. The MRC gave final approval to IBM's Fixed Term Plan (FTP) on May 25, 1971.

F93. The task force's presentations and recommendations to IBM's MRC during May of 1971, indicated that some disks, tape and printers were going to be included and some omitted from FTP, and that there would be an omission of card I/O devices and system 3 products. Most of its iterative forecasts were in

terms of the impact that IBM action would have on IBM's plug compatible competition. The inclusion of the 1403 N1 and 3411 printers was recommended because of plug compatible competition expected from Telex. The task force determined that the Fixed Term Plan leasing would cost IBM millions of dollars in revenues and profits during the first two years, and projecting that on disk drives IBM would lose $13,200,000 in 1971, and $20,300,000 in 1972; on tape drives $6,500,000 in 1971 and $5,300,000 in 1972; on printers $11,800,000 in 1971, and $18,500,000 in 1972. In short, the task force determined that IBM would sustain revenues reduction of more than $75 million in 1971 and 1972 by putting tape disks and printers under FTP leases. Notwithstanding these projected losses, it was thought that FTP would be very profitable to IBM in the long run because losses from plug compatible competition would be decreased and it would have more units out in the field for longer periods of time.

F94. On May 27, 1971, IBM announced FTP. One and two year leases on IBM disk, tape and printer peripheral products (except those excluded) were provided for, with an 8% monthly rental discount for one-year leases and a 16% monthly rental discount for two year leases. IBM also eliminated its extra use charges on products leased under such leases. Punitive penalties for cancellations of a lease by a customer were included. The penalty for a two year lease terminated during the first twelve months was five times the monthly rental charge. The penalty for a one year lease cancellation, or a cancellation of a two year lease during the second year, was two and one-half times the monthly rental charge. IBM also reduced the purchase price by 15% on the products covered.

F95. IBM's price cuts under the Fixed Term Plan were even greater than the apparent 8% to 16%. The elimination of IBM's extra use reduced IBM's monthly rental charges on disk products covered by the two year Plan by 31%, and its tape products by

20%. On printers the reduction was about 30-35%. The price cuts in some instances put IBM prices below those of its plug compatible competitors.

F95a. Between 1968 and 1972, Telex had a number of products which competed with IBM products. There were many price changes and price variations during this period. All of those Telex products were at all points in time listed at lower prices than comparable IBM products except on four isolated occasions. Telex's prices were generally higher than the prices of other plug compatible manufacturers. In addition, Telex and the other plug-compatible manufacturers generally reduced below list the prices they actually charged through various forms of price concessions.

F96. The benefits anticipated by IBM in connection with the adoption of FTP revolved around the suppression of IBM's plug compatible competition. Indeed, the very creation of the task force was occasioned by plug compatible competition. Pricing presentations of the task force to the Management Review Committee were importantly concerned with comparisons of plug compatible prices and projections. Defendant's officers at the trial expressed the view that FTP was simply to render the company "more competitive" and to obtain more business by meeting the competitive efforts on a basis similar to that of plug compatible suppliers. It is the court's view that such justification, which could be convincing under different circumstances, is overpowered by IBM's monopoly position in the particular markets involved and the rather clear indication that its action was directed not at competition in an appropriate competitive sense but at competitors and their viability as such. The products specified by FTP were those peripheral products on which IBM was receiving, or on which it anticipated that it would receive, substantial plug compatible competition. The statement at the trial by Mr. Cary, Chairman of the Board, President and Chief Executive Officer of IBM, that tapes and disks

were covered because "we, obviously, had to reduce our prices on them or go out of business and so they were very logical candidates for the Fixed Term Lease Plan", aside from its character of confession and only attempted avoidance, was overstated factually. IBM's plug compatible competition in the disk tape area did not threaten to drive IBM out of the business in those markets. In June of 1971, IBM's plug compatible competitors had only 14.5% of the plug compatible disk market and 13.7% of the plug compatible tape market, and IBM's worst case forecast, that is, "if IBM did nothing", predicted that IBM's plug compatible competition in total would capture 28.7% of the 2314/2319 plug-compatible disk installations, 48% of the 3330 plug-compatible disk installations, and 19% of the plug compatible tape market by 1976. Nor is Mr. Cary's explanation that FTP was merely an experiment borne out fully by the record; it was directed specifically at markets in which plug compatible competition was of special concern to IBM and the selection of these areas was not on the basis of a random experiment to ascertain the effect of the plan, but to accomplish results with respect to these markets forecast in advance by its experts. The plan was extended beyond disks and tapes to printers from an apparent desire to lock up that market before Telex could start deliveries. On May 6, 1971, the Management Review Committee directed the task force to prepare a long term lease approach for disks and tapes "plus a strategy for memories and printers". Telex was known also to be interested in memories.

F97. IBM did not place its CPU's under the Fixed Term Plan. In fact, IBM raised its prices on its CPU's and 360 memories to offset its peripheral price cut within two months after reducing its prices on its disk, tape and printer products under the FTP. Long term leasing represented a substantial change in IBM policy not only in the swing from short or open-ended leases, but in previously contemplated general pricing policy. Mr. Emery, a member

of the task force wrote: "It was pointed out in most instances that any policy change which we now advocate for peripherals would have to be applicable to processors as there is no justification for different treatment." One of the studies had concluded that long term lease plans "must apply across the board—peripherals not different". IBM's Management Review Committee at one point instructed the Cooley Task Force not to consider long term lease plans "since there does not appear to be a way of limiting such a plan specifically to the peripheral marketplace".

F98. By January, 1971, IBM had determined that it needed a price increase on products not covered by FTP. The Management Review Committee was actively considering raising IBM's prices in March, and on March 30, 1971, the Data Processing Group made a recommendation to IBM's Management Review Committee for a price increase on CPU's. On April 7, 1971, Mr. Learson wrote Mr. Bietzel stating: "We believe at the moment that we should postpone any pricing action for another month . . ." In late June, IBM rejected the idea of placing CPU's and memories under a Fixed Term Plan on the ground "this would prematurely erode the FTP concept to the entire product line, and, in addition, would be ineffective unless accompanied by some degree of pricing action." IBM not only increased its prices on CPU's and memories in July, 1971, but it was IBM's estimate that those price increases would offset IBM's price decreases on disk, tape and printer products placed under the Fixed Term Plan. On August 5, 1971, Mr. Powell of IBM wrote: "I can support the position that the net effects of the FTP and price change will probably be a wash insofar as business volumes are concerned . . . The net effect of the FTP and price changes will not significantly increase [the customers'] total cost and no system decreases were forecast."

F99. In March 1972, IBM announced its "Extended Term Plan" (ETP), a variation of the Fixed Term Plan having no substantially separate or different economic impact of consequence

in this case. ETP also was optional, IBM customers having the opportunity to rent IBM equipment under the 30 day lease contract formerly utilized by IBM if they were willing to forego the price reductions provided in FTP. The defendant has now three long term lease plans pursuant to which it leases central processing units, tape drives and tape drive controllers, disk drives and disk drive controllers, printers, communications controllers, consoles, channels, and other products. In March of 1973, IBM announced a term lease plan which offers a four year lease on System 370 virtual storage processors.

F100. Surface justification for IBM's turning to fixed term plans does not insulate its conduct in monopoly context from serious question. Since the mid-1950's IBM and others have offered their customers the opportunity either to purchase computers or to lease them on short term leases basically cancelable on 30 days' notice. Until the early 1960's many customers were hesistant about making commitments longer than for a month or so at a time because of the difficulty of evaluating the rapid changes in EDP technology, which situation changed with increasing sophistication of customers and more general acquaintanceship with industrial developments and prospects. For a number of years prior to IBM's announcement of the Fixed Term Plan in 1971, many of its competitors had offered lower prices on long term leases with cancellation penalty clauses or with no cancellation option at all. By 1971, most of IBM's competitors, including systems and peripheral competitors and leasing companies, were offering users long term lease options. IBM's studies indicated that a long term lease plan on peripheral products, among other things, would reduce IBM's costs through decrease in "churning" of IBM's leased equipment at the same time and for similar reasons that its competitive position in relation to PCM's would be enhanced. But preponderant evidence demonstrates that IBM's fixed term plan was generated and implemented at the time it was

with the primary intent and purpose of suppressing plug compatible competition and to maintain its monopoly power in the plug compatible disk, tape and printer markets and the general plug compatible market for peripheral devices.

F101. With reference to the FTP, as in the instance of the 2319 and memories, the intent and purpose of IBM in taking competitive action or reaction becomes important in view of its dominant position in the markets. Some of the evidence is equivocal. One of the difficulties lies in the inadequacy of the minutes of the Management Review Committee to clearly indicate the reasons for approving the actions complained of here. There was an abundance, or perhaps IBM would now think an overabundance, of documentation in lower echelon views, studies, computations, projections, forecasts and recommendations leading up to the action of the Management Review Committee, the top executive authority in IBM. In retrospect, and in view of the absence of full documentation at the top, inferences are arguable and have been argued to the effect that the predatory intent clearly indicated by task force or other processors of problems, and their related data, were disregarded or rejected by top management. But I have felt constrained to reject this bland construction by consideration of the record as a whole, and by the very organizational framework within which the record demonstrates such decisions and intents were initiated, formulated and pursued. In the first place I am doubtful that the intent of subordinate agents must be entirely disregarded in determining intent of a corporation represented, as all corporations are, by top management. Especially is this so in the case of IBM, which the evidence makes clear was finely tuned, organized and managed to reflect to top management the composite of a sophisticated, widespread and coordinated employee organization for the purpose of management decisions. In the absence of some clear record or indication to the contrary, it reasonably may

be inferred that top mangement in adopting recommended actions or modifications not inconsistent with the data and recommendations submitted did not entirely reject their rationale and reasoning. Moreover, there is considerable direct evidence on vital points to indicate that top mangement itself did in fact subscribe to the anticompetitive views and objectives of lower echelons, the numerosity and pervasive nature of which preclude their disregard.

F102. One of many examples of the relationship of corporate investigation and processing to corporate decision, the comprehensive and systematic studies constituting input into top management, and the likely dependability of those studies, is furnished by plaintiffs' Exhibit 107R, somewhat randomly selected. This exhibit is headed "Key Corporate Strategic Issue . . . Peripherals". The objectives were listed as "A. To assess all pertinent factors affecting current and future impact of competitive compatible products on IBM's worldwide business. B. To review current IBM strategies, policies and practices and to identify and prioritize exposure areas in relation to A above. C. To recommend actions required to produce an optimum IBM strategy for peripheral products." After listing "External Factors" such as itemized "Federal Government Environment and Influence", "Marketing Environment", "Maintenance Environment", "Manufacturing Environment", "Pricing Environment", "Engineering Environment", and "Market Potential and Trends", and after listing "Internal Factors" including "Ease of Competitive Interface" and "Legal Considerations", the "Scope of Issue" is defined. "The scope of this issue", says the memorandum, "shall be selected competitive compatible products which replace IBM products in an IBM computer system." To obviate any uncertainty, "Competitive compatible products" are further defined as "system attached input/output and memory products." In further refinement it is stated that "Input/output products shall include . . . magnetic tape drives and control units, direct access storage products and

control units, impact printers and control units, card readers, card punches, reader/punches and control units." "Memory products shall include main (buss connected) and large capacity storage (plug connected)". "Excluded products" were "Central Processing Units (CPU)-consoles-paper tape products-communication products and control units-R. P. Q.'s and non-standard products-non system attached products." A comprehensive methodology utilizing line and staff resources, calling for "action program(s) for each pertinent factor", and for the presentation of "program recommendations to MC" (Management Committee). Specific assignments were then made to various staffs, including "Marketing" and "Legal", with an indication that additional line organization was "to be designated by DP Group and WTC." Each assessment was to include *inter alia*, "IBM Strategy/Policies/Practices Relating to this Factor", "Identification and Priority of Major Exposure Areas" and "Recommendations for IBM Actions."

F103. IBM's Fixed Term Plan effectively suppressed the growth of plug compatible competition in the plug compatible disk, tape and printer markets and effectively contained IBM's competition in the plug compatible market for peripheral devices. IBM's plug compatible competitors' share of the plug compatible disk market never exceeded 17.5% after June, 1971. IBM's plug compatible competitors' share of the plug compatible tape market never exceeded 15% after June, 1971. Immediately upon the announcement of IBM's Fixed Term Plan IBM instituted an in-depth tracking procedure to determine the effectiveness of IBM's Fixed Term Plan. On June 18, Mr. Rodgers reported to Mr. Learson that IBM had already signed up 16% of its entire installed disk, tape and printer base on the Fixed Term Plan. On June 24, Mr. Justice reported to Mr. Hume that Fixed Term Plans then covered 19% of IBM's installed base on disks, tapes and printers, and by July 22, 1971, 40% of IBM's disk, tape and printer installed base was covered by FTP. Mr. Learson wrote, "They are reporting

a 40% coverage on FTP. Is this high or low with reference to what we expect. I consider this very important." And the answer came back, "Our objective was to hit 40% coverage on files, tapes and printers combined by 12/31/71."

F104. IBM's plug compatible competitors as expected by IBM made competitive price reactions to the Fixed Term Plan. By June 17, Telex became the fourth plug compatible competitor to announce a price reduction; but even with such price reductions the plug compatible competitors could not successfully compete with the Fixed Term Plan. Mr. Rodgers estimated that the Fixed Term Plan cut IBM's plug compatible competitors' order rate by 50%. IBM's tracking showed that 90% of its new disk and tape products, specifically its Merlin and Aspen products, were being installed under FTP. This tracking was in accordance with IBM's estimate made in June, 1971, that on the Merlin FTP acceptance would be 95% of the rental base and; in fact, IBM's acceptances have been at the 95% level anticipated by IBM. IBM in its internal documents described the competitive constraints that its FTP imposed upon plug compatible competition, particularly plug compatible competition for the new 3330 disk and 3420 tape products: "One competitor has already announced a PC 3330/3830 and others can be expected to follow soon. . . . The competitor will offer long term leases similar to IBM's with the base rental initially 10% below ours and declining 5% per year. The competitor will face a new environment, however, in that the bulk of his early installations will represent conversions from PC or IBM 2314's rather than plug for plug replacements of installed 3330's. This will be due to the user's reluctance to break the IBM contract due to the penalty payment required. As a result, the competitor will face harder selling and harder installation since he has not yet shown the capability to provide systems, conversion, and application support. . . . While the PC competitors will make a strong effort, it is assumed that near-term 3330 erosion will be contained

until the FTP contracts approach maturity. By that time, Winchester, Iceberg, the 3330A/B and the 333M will all be available as customer options and should hold the market for IBM. . . . The 3330/3830 FTP will receive wide acceptance in the marketplace. It is estimated that 95% of the rental base during 1971 and 1972 will be under FTP. . . . It is further assumed that the savings engendered by the FTP will increase the migration rate from the IBM and PC 2314-type products into the 3330/3830."

F105. By the end of 1971 the effect of FTP on plug compatible competitors was measured by IBM. DP Commercial analysis reported in December, 1971, "Since the announcement of FTP, there has been a 62% decrease in PCM tape monthly sale rate." In disk drives Commercial Analysis reported, "In 4.5 months since IBM's FTP announcement, the PCM monthly sales rate is down to 475 spindles per month, off 48% compared to 905 per month during the first 5 months of 1971."

F106. The plaintiffs claim that the internal Integrated File Adapter for 3330 disk drives used with the 370/135 coupled with a price substantially less than the external 3830 Mod. 2 equivalent, constituted a discriminatory physical and economic tie between the IFA and the 370/135 central processing unit; and that the internal ISC with the rental price substantially less than the external stand-alone equivalent constituted a discriminatory physical and economic tie of the ISC to the 370/145, 158 and 168 central processing units. These integrated controllers consist of control electronics contained within the same boxes or frames as the CPU's or other EDP equipment and using a part of the CPU resources to perform their functions. IBM offered customers the option of acquiring integrated controllers at prices lower than stand alone controllers and there is no question that prices were substantially lower for the integration. Unlike the situation which existed in respect to the Mallard, the fixed plan leases and IBM's actions directed to memories hereinafter considered, the integra-

tions mentioned are not shown to have been dictated by specific predatory objectives on the part of IBM. While some question is raised in the evidence as to the economic justification for the extent of the price reductions, and some justifiable suspicion may exist as to predatory intent, a finding that such intent was a significant motivation for the integration is not deemed warranted by the evidence in view of the preponderant showing that these integrations represented a legitimate technological and performance advance consistent with trends in the industry and at significant decreased cost.

F107. While cost and performance justifications may have existed to an extent, it is found that IBM lowered the price of its FET monolithic memory products and raised prices on its CPU with the primary purpose of creating barriers to entry for potential plug compatible memory competitors. The 370/155 and 165 were introduced in June, 1970, with magnetic core memories which were contained in boxes external to the CPU, but which were cable-connected to the CPU. The main memory for the 155 and 165 consisted of the 3360 processor storage together with a high speed monolithic (bipolar technology) buffer storage which made up a two level "hierarchical" type memory. IBM was greatly concerned with the high market penetration which independent manufacturers of plug compatible memories for System 370 threatened, it being estimated by it that such penetration might amount by 1976 to as much as 23%. Pending the availability of improved technology, IBM's Management Review Committee explored and adopted a memory strategy which repriced memory by reducing prices and by at least partly offsetting this reduction by an increase in CPU prices. Its studies indicated that plug compatible memory companies could become viable competitors in supplying memory for IBM CPU's by offering their products at $6,000 per megabyte if that price was under IBM's prices; that is, viability and entry would depend upon the slope or pricing level of IBM's FET monolithic memories.

F108. IBM formed another task force in March, 1971, which was charged with the mission of developing a "memory strategy" which would optimize profit and revenue for IBM and also control the market penetration that was forecasted for plug compatible memory products. The work of this memory task force included an attempt to fix a price for IBM's monolithic FET memories that would influence potential plug compatible competitors to stay out of the market. The IBM Management Review Committee set the monthly rental price for IBM's FET monolithic memory at $5,200 per month per megabyte, which was less than the amount reporting experts had indicated a potential competitor would be required to charge in order to enter the market and be profitable and viable. The monthly rental price for the 158 CPU was raised from the $20,600 charged for a 155 CPU to $30,700 for the 158 CPU to offset the decrease in price for the FET memory, the percentage increase in price being higher than the percentage improvement in performance. The monthly rental price for the 168 CPU was raised from the $36,400 charged for a 165 CPU to $48,600 charged for a 168 CPU to offset the decrease in price for the FET memory, the percentage increase of the 168 CPU when compared to the 165 being higher than the percentage improvement in performance. Neither the design of the 370/158 and 370/168 nor the price of $5,200 per megabyte per month prevented Telex from planning competing memory products and in March, 1973, it announced that it would market memory components for 158 and 168 systems. Control Data, Itel, Ampex and Intel have announced memories for IBM's 370/158 and 370/168 systems at prices substantially below IBM's price.

F109. The same task force studied a proposal that "concurrent with the introduction of FET memories, the minimum entry sizes of the 145, 155, 165 and 195 be raised." A chart considered by it showed that a "minimum" memory of one-fourth megabyte on the 145 would "protect" 71% of the 145 memory from exposure

to competition, a "minimum" memory of one-half megabyte on the 155 would "protect" 42% of the 155 memory; and, a "minimum" memory of one megabyte on the 165 would "protect" 37% of the 165 memory from competition. Plug compatible memory vendors were forecast to receive a $35 million share of the market for memories on System 360, $623 million share for memories on System 370 if IBM did not take preventive action. One of the financial analysts, Hochfeld, in March, 1971, raised the question with his superiors of the legality of increasing memory minimums and the danger of a civil damage suit. He testified at the trial that based upon the studies and analysis that he had done it was his opinion that when IBM dropped its price of FET monolithic memories for the 158 and 168 to $5,200 per megabyte it made it impossible for anybody to enter the field and be viable competing with IBM on the 158 and 168 memories.

F110. Beyond the matter of pricing, plaintiffs contend that IBM ". . . unlawfully bundled" a minimum FET monolithic memory "under the covers" with its 370 CPU's so as to protect a substantial portion of the memory from exposure to plug compatible competition. There is further indication of an anticompetitive design in the investigation of proposals for minimum memories in IBM CPU's, but, again, it appears that there are so many practical and technical justifications for the integration of memory as to raise substantial question concerning the validity of plaintiffs' contention on this point. Memory is an essential component of the central processing unit since all processing units must have storage to operate. The integration of memory generally tends to reduce cost and improve performance. If memory is packaged separately in a separate box it does require additional frames and covers; it requires its own separate cooling system, power supply, acoustic baffles and electrostatic shielding. It also requires extra cables. The speeds and circuits used in CPU's have increased dramatically in recent years; to best take advantage of this faster

technology it seems desirable, all other things being equal, that memory be integrated into the CPU's so that the wire lengths between logic and memory elements be reduced as much as feasible. As a result of cost and performance advantages integration is accepted as an industry standard and an objective of good engineering design. Historically most CPU's designed by IBM and various other EDP suppliers have included a minimum main memory integrated within the CPU. Historically, also, whenever a main memory has been integrated within a product it has been included in the price of that product and not separately priced. Reduction in the size of memory components has made it practical to integrate more memory with the logic elements of the CPU.

F111. The preponderance of the evidence establishes in the case of IBM's 370/158 and 370/168 CPU's that IBM's integration plan was adapted primarily to achieve the cost and performance improvements made possible by reduction in size of the memory component. Other companies are still able to attach their memories to IBM 370/168 and 370/158 Systems and Telex has recently announced its intention to do so. The IBM 370/155 and 370/165 primarily use magnetic cores for memory, and because of its size such magnetic core memory is sold in a separate box. At the time the 370/155 and 370/165 were announced, advances in semiconductor technology were rapidly obsoleting core memory technology. The main memories of the IBM 370/158 and 370/168 CPU's announced by IBM on August 2, 1972, are made up of FET semi-conductor circuitry. The trend toward miniaturization of computer circuitry no doubt will continue in the future to permit further integration. Telex itself anticipates that memory chips containing 8,000 circuits will be commercially available by the time it delivers its replacement memories for 370/158 and 370/168 Systems. Using an 8,000 circuit chip, 4 megabytes of storage can be housed in a space approximately 21 inches by 15 inches by 6 inches. Chips containing 64,000 circuits are presently under devel-

opment at a number of laboratories. IBM anticipates chips containing 256,000 bits by the 1980's. In the court's view it would not be a proper application of the antitrust laws under the circumstances shown by the record to preclude or discourage the utilization of advancing technology by this type of integration. The testimony, and particularly Hochfeld's, affords some indication that one of the motivations for the "bundling" of the minimum memory by IBM was to reduce exposure to plug compatible competition. Yet, dominant justifications on other grounds lead the court to believe that this was not unlawful in and of itself, however significant some of the related testimony may be an indication of a predatory intent primarily directed in actuality to other areas as herein found.

F111a. There was no evidence that IBM reduced prices below cost and a reasonable profit. Indeed, when announced the profitability of the 2319 disk storage units, the 370/158 and 168 CPU's and CPU memory elements were anticipated to be in excess of 20%. Likewise, at the announcement of FTP it was anticipated that the profitability of the products to which it applied would be at least 20%. Those profit margins in part, of course, would have been achieved by obtaining leases of products which would have otherwise been made by Telex and other PCM's. Those price reductions are found to be predatory.

F112. IBM's growth and success in the industry have been due in substantial measure to its skill, industry and foresight. It has tended to set the standard for quality in the EPD industry for products and services. It has met notably favorable response in the market, and has been deeply involved in the phenomenal growth of the industry since almost its beginning. Each succeeding generation of IBM products have represented some technological improvement over the preceding generation and has involved development of new processes, storage devices, input/output devices and software. In the approximately twenty years that the EPD

industry has been in existence IBM has introduced more than 600 products. Some of these products include major technological innovations. By virtue of its own research and development, IBM has obtained more than 10,000 patents which are freely licensed. I therefore cannot fully agree with Telex's contention that "IBM did not gain, nor has it maintained its position in the industry through skill, industry and foresight". No doubt it gained a dominant position in the industry through a praiseworthy degree of these qualities. Whether there was anticompetitive conduct that went along with them in recent years prior to 1969, the record does not disclose. The real problem here is notwithstanding this, whether IBM has maintained its monopoly position, or attempted to do so, by unlawful conduct since 1969. In the respects determined here in the critical period at least it must be recognized that its diligence and foresight have included the competitive studies and the anti-competitive objectives and intent heretofore found, and that particularly as applied to this case have included an attempt to substantially constrain or destroy its plug compatible peripheral competition by predatory pricing actions and by market strategy bearing no relationship to technological skill, industry, appropriate foresight or customer benefit. With such intent and objectives manifest with respect to its plug compatible competition, it is understandable that the defendant should be particularly opposed to the recognition, as essentially separate entities or markets, of what was intially a part and parcel of its own internal business over which it exercised legitimately a 100% control—the peripherals attached to its own developing system. But we find unconvincing the idea that separate markets or submarkets actually recognized by IBM itself in this dynamic and amazing industry could not have been developed eventually from IBM's prior lawful domination of it; or that the objectives and planning of such a presently dominating force against the competition of the peripherals could somehow be deemed dissipated among lower eche-

lons of this great organization and not considered to be reflected in the competitive actions of top management, or that, if reflected, should be held innocuous or futile, or at all events lawful, as competitive weapons.

VII

Impact and Damages for Antitrust Violations

F113. Telex now claims that its damages resulting from unlawful predatory acts of IBM total $361.3 million, and that these damages are comprised of $257.7 million in deprivation of market share, $92.3 million for lost rental profits and $11.3 million for lost sales profits.

F114. The record leaves little room to question that the acts, conduct and intent on the part of the defendant found herein to have been in violation of Section 2 of the Sherman Act proximately caused substantial impact and damage to the business of the plaintiffs, and the court so finds. Aside from its quantification beyond substantiality, such impact is to be found in the circumstantial evidence as a whole, the direct evidence by way of opinion and judgment of Telex officers and witnesses, some evidence elicited by the cross-examination of the defendant's witnesses, the admitted fact that such acts were competitive responses on the part of IBM to the inroads the plug compatible competition was threatening and making against its market position, by reasonable inference in view of IBM's market domination and organizational effectiveness that these responses must have advanced their purposes to some appreciable degree, and from a number of statistical indications to be referred to in some detail in connection with a determination of the amount of damages to which plaintiffs are entitled.

F115. As to any specific amounts of damages awardable in this case the evidence is less clear, and as justification for the sums asked for quite unsatisfactory and insufficient. There is evidence

tending to show that Telex had a taxable income of $12,462,000 for fiscal year 1971; for fiscal year 1972, after the effects of the 2319 announcement were expectable, Telex's loss was ($913,000), and for fiscal 1973, after 2319 and the FTP influence, its pre-tax loss was estimated to be approximately ($7 million). Its gross receipts of $77,843,000 in fiscal year 1971 declined to $56,076,000 in fiscal 1972. At the end of fiscal year 1971 (after 2319 but before FTP) the market value of Telex's stock was $19 a share or $197,999,000 for all shares; two years later, after FTP, it was $4.60 per share or $48,143,500 for all shares, a loss in value of $149,855,500. According to Telex's November, 1970, forecast and product plan, a profit of $33,837,000 would have been produced in fiscal years 1972 and 1973. Telex's initial November, 1970, forecast showed a projection of 8,910 units, and Telex actually shipped 4,517 units through March 31, 1973. Following the 2319A and B announcements and FTP, Telex had been able to make third party sales of $30 million from January 1, 1971 to March, 1973, while in 1969 and 1970 almost $120 million in Telex tapes and disks were sold to third parties. Prices at which equipment could be sold has eroded some 35% as compared to the 1969 and 1970 prices. Marketing expenses increased. Backlog and order rates were reduced. Recruitment of adequate personnel became more difficult as uncertainty as to Telex's future viability increased. "Front end" expense has been increased by inadequate concentration of products and services. Competition among Telex and other plug compatible manufacturers for remaining business has intensified. Telex's ability to secure financing has been impaired, and Telex has had to pay more for financing. There is some evidence that Telex's problems are not unique in the plug compatible market; that some companies following 2319 and FTP failed in or abandoned their plug compatible business. There was a "plateau" that existed in Telex's installations growth from about November, 1971, to about July, 1972. From September, 1969, to

November 1971, Telex's domestic installation or "population" of peripheral devices increased from 1,000 units to 8,000 units. From about November, 1971, to about July, 1972, the last month included in the Telex chart reflecting such plateau, Telex's installations neither substantially increased nor decreased.

F116. There was evidence developed by IBM at the trial that Telex's forecasts were untried and unreliable upon which to base damage and impact claims and that in any event, the recorded business experiences of Telex were explainable by various factors and influences unconnected with IBM's business practices. It dismisses Telex's income tax returns as unreliable for the purpose of indicating damages, pointing out that in 1972 Telex changed for tax purposes from the accrual method of accounting for certain revenues to the installment method, thereby slowing down the tax reporting of revenues on certain leasing company transactions. The tax return handling of depreciation of Telex's retained equipment and interest expense is also attacked. The necessity of a detailed and complex analysis including a reclassification of all items of expense and revenues is emphasized by IBM and in the absence of such a study and restatement it is asserted that the income tax returns have little or no value for comparative purposes or even as statements of actual income. The significance of stock price changes is also dismissed by IBM, it being claimed that there is no evidence relating the fluctuations or declines in the market prices for Telex stock to any or all of the IBM actions of which Telex makes complaint, and that such stock fluctuations are assignable in whole or in part to adverse publicity over Telex's accounting methods and other circumstances over which IBM had no control. Finally, IBM demonstrated with some persuasion that Telex's difficulties at least in part stemmed from its own problems of management, testing, service, organization and personnel. Defendant's charts 143, 144 and 145 indicate that while Telex disk drive spindles and tape drives installed on CPU's manufactured by IBM leveled off markedly in number for the period 1971-1972, as Telex showed, similar non-Telex installations continued to appreciably advance. In the latter connection it is notable, however, that about the time the acts complained of by Telex were becoming effective to the extent they did, there was a discernible diminution in the rate of increase of even these non-Telex installations. Telex's response to the claimed adverse effect of its management and other internal problems is that they are more or less normal to the industry and that most of them have been intensified to critical stages because of IBM's predatory actions. Telex says that the February 7, 1973, product forecast from which IBM concludes that "Telex has turned the corner" is only a manufacturing capability forecast in support of which at the time of the trial it was not assured that adequate financing and third party sales would be available that the order rate is nowhere near the forecast, that since the first of the year there has been a significant reduction in the level of product shipments and new production units shipped for this fiscal year are 50% lower than forecast.

F117. My task would be simpler if as to each element of claimed damage clear and unhampered casual lines could be discerned, leading to IBM's predatory acts without passing through or commingling with the literally hundreds of other circumstances which may have influenced the figures. But in cases like this, if not in every complex case, it is humanly impossible to trace, find, and specify in detail and quantify in effect the numerous circumstances which cause or contribute to financial consequences. By such a process the determination of damages by court or jury could be bogged down in almost any case or rendered more inaccurate than a considered judgment appraisal of the combined effect of all actionable elements duly considered by an informed fact finder after elimination of the influence of extraneous causes. The record fragmenting of judgment might be either a mere exercise in futility or a mechanical allocation of the result of the aggregate judgment

at best. It is the damage that must be quantified rather than the respective weights or contributions of the unlawful causes so long as each has substantial effect upon the damages suffered by the injured party so as to constitute their proximate cause. Notwithstanding the difficulty involved, I have found that there is reasonable basis in the evidence to fairly approximate the damages to which plaintiffs are entitled as proximately caused by the unlawful acts and conduct of the defendant.

F118. The largest component of the damages claimed by plaintiffs relates to the deprivation of market share, based on the difference between Telex's forecast of November, 1970, and Telex's forecast of January 12, 1972. Product rental prices in effect prior to 2319 were used, product life was based upon IBM estimates, and Telex's usual product and marketing expenses were used. Telex's November, 1970, forecast was prepared prior to the predatory actions of IBM except for the 2319A announcement. The number of units was smaller than those forecast for Telex by IBM's April 16, 1971, internal forecast, which took into consideration the impart of IBM's 3420 tape price cut and IBM's 2319 disk drive pricing cut. Telex's January 12, 1972, forecast reflected anticipated product shipments greater than Telex's actual business turned out to be over the same period. The difference between the Telex November, 1970, and January 12, 1972, forecasts was less than IBM's internal documents indicated that it expected Telex to receive prior to IBM's Fixed Term Plan announcement. IBM's internal documents indicated that IBM calculated its increased profits that would result from adoption of the Fixed Term Plan leases for tapes, disks and printers to be $466 million. Using the latter assumption and considering that in 1970 Telex was installing approximately 53% of the non-IBM plug compatible tape drives, 31% of such disk drives and 100% of such plug compatible impact printers, a calculated loss of market share from FTP would be $218.67 million. In support of its loss

of market claim Telex also cites income tax records and stock prices as indicated above, but relies primarily upon a comparison of documents described as the November, 1970, forecast and a January 12, 1972, forecast.

F119. There are circumstances relating to these forecasts which preclude their acceptance at face value notwithstanding some supportive evidence of other types. The handwritten documents assembled as the November, 1970, forecast were prepared by different people at different times. No part of the document is actually dated and the text of the initial pages indicates a date of preparation after February 18, 1971, even though Telex prepared an entirely new and substantially reduced forecast in February, 1971. Neither the November, 1970, forecast, nor the January 12, 1972, forecast is supported by the usual written assumptions which the evidence shows were utilized in their preparation. Forecast assumptions were "very informal and very unstructured" in the words of one of plaintiffs' witnesses. The Telex calculation is based upon the highest forecast it made for selected products compared with the lowest forecast made for those products and the forecasts had no substantial history of reliability or accuracy. Under such circumstances, while these forecasts have been considered to be good faith evaluations in the course of business operations and for business rather than litigation purposes and thus entitled to consideration, calculations based upon them must be weighed with due regard for their limitations and other evidence. Moreover, plaintiffs' calculations have assumed that variation in units forecast was caused solely by the IBM actions complained of, or to be found as unlawful by the court, without giving weight to the effect of established internal difficulties within Telex over which IBM had no control and the claimed unlawful integration action that has now been found to have been non-actionable.

F120. These and other limitations in the sufficiency of plaintiffs' proof to support their claim for deprivation of market share in

full leave the question whether any such claim is thereby defeated entirely or, if not, what amount of damages has been established by way of fair approximation on the evidence in view of the fact that IBM's predatory actions have deprived the plaintiffs of the opportunity of positive proof of what their experience would have been in the absence of such action. There must also be evaluated in any award the question of to what extent the uncertainty of proof relates to IBM's predatory action and to what extent, if any, it relates to any inexcusable failure on the part of the plaintiffs to submit evidence reasonably available to it. As to the latter problem, if trial counsel is not to be hindsighted, I am inclined to believe that generally speaking the plaintiffs must be considered to have submitted the best proof of which the nature and complexity of the case reasonably were susceptible. There is no evidence that there were any better forecasts available nor any indication that those used were contrived particularly for the purpose of prospective litigation. The opinion evidence was based on plaintiffs' theory of liability and as it turns out it would have been more applicable had it been based upon the court's findings after trial of what conduct was lawful or unlawful rather than upon pre-trial expectations or hopes concerning bases of liability. Beyond such forecasts and opinions, it is difficult to see how loss of market share could be established with any specificity, or how elements of loss of market share could be traced and evaluated much more in detail with reference to various factors that may have entered in by way of possible influence. To attempt by expert testimony to evaluate and weigh each individual factor and to categorize and evaluate the relative influence of each alleged predatory act against the possibility that the court might not sustain contentions as to some of them might so complicate a trial, extend the evidence and compromise the trial position of a party from the inception as fairly to be considered impractical and unjustified. While the question is not free from doubt, it appears to the court

that any uncertainty concerning the amount of the loss of market share is not so ascribable to fault on the part of plaintiffs as to deprive them of the benefit of the rule that where the existence of impact and damages have been shown by a preponderance of the evidence, reasonable approximations of the extent of damage based upon the reasonably available evidence is not to be rejected.

F121. It has been found that sufficient evidence was introduced to show preponderantly that plaintiffs suffered substantial damages in an ascertainable approximate amount from the unlawful acts of the defendant in deprivation of the market share that it would have enjoyed had the unlawful acts of the defendant not been committed, and that taking into consideration the strengths and weaknesses of the plaintiffs' proof as to damages in view of the whole record, eliminating the results of internal, collateral or other considerations over which IBM had no control and unrelated to its unlawful acts, and excluding damages for lost rental profits and lost sales profits hereinafter to be separately considered, such element of damage reasonably awardable herein amounts to $70 million, subject to the adjustments made in F124 with respect to the net antitrust damages to be awarded in favor of Telex.

F122. It has been found that sufficient evidence has been introduced to show preponderantly that plaintiffs suffered, from lost rental profits, substantial damages in an ascertainable approximate amount from the unlawful acts of defendant, and that taking into consideration the strengths and weaknesses of plaintiffs' proof in view of the whole record, and eliminating the results of circumstances over which IBM had no control and which were unrelated to its unlawful acts, such element of damage reasonably awardable herein amounts to $39 million. This sum represents the difference in profits from Telex's installed units based upon rental charges actually received and that would have been received in view of defendant's unlawful acts, as compared to rental profits that would have been received on rental prices in effect

prior to IBM's 2319 and FTP announcements, with elimination of factors not attributable to IBM. Approximately $20 million of this total amount is made up of past and future claimed lost rentals on all Telex shipments prior to April 1, 1972. The other $19 million is lost rentals on shipments reasonably to be anticipated as taking place after March 31, 1972. These findings are subject to the adjustments made in F124 with respect to the net antitrust damage to be awarded in favor of Telex.

F123. Telex's claim of $11.3 million damages for "lost sale profits" from leasing company transactions is based on a reduction in the price and sale "multiples" as a result of IBM's pricing actions. Telex claims $8.5 million in lost profits on the Pepsico transaction, $1.3 million on the Hudson disk transaction, and $1.5 million on the Transamerica disk transaction. As in the cases of other classes of damage claimed by Telex, I find generally speaking that plaintiffs' witness Heavener properly analyzed and applied the formula for fixing damages to the data and assumptions available to him, the accuracy of the results being limited by the limitations of these data and assumptions. I cannot agree that a comparison of sales multiples in different third party agreements and other possible variables pressed by defendant indicate neither the fact of injury nor the amount of damage. The variables were explored or touched upon in a general way in the evidence as are other possible adjusting factors. I am convinced that allowing IBM the maximum reasonable benefit of these and other possible variables would not decrease Telex's claim of lost sale profits from leasing company transactions by more than $2.8 million, or roughly 25%, and that other objections to the validity of the plaintiffs' figure adequately have been met by the evidence. Accordingly, I find actual damages suffered by plaintiffs in lost sale profits proximately caused by the defendant's unlawful acts amount to be $8.50 million. These findings are subject to the adjustments made in F124 with respect to the net antitrust damage to be awarded in favor of Telex.

F124. Accordingly the court finds that as a proximate result of IBM's unlawful acts and conduct the plaintiffs have suffered actual damages totaling $117.5 million, subject to the following adjustments: (a) An adjustment of $6 million representing by fair approximation the corrective or diminishing effect of the injunctive relief granted against IBM upon the damages that would be otherwise recoverable;* (b) unjust enrichment and damage items included in the judgment against Telex on IBM's first counterclaim for trade secret violation in the sum of $17.5 million which represents the best available quantification of the competitive advantage unlawfully obtained by Telex in establishing the market position upon the basis of which antitrust damages were in part determined by the court and which should be deducted from otherwise allowable antitrust damages before trebling; and (c) the additional sum of $7.5 million representing by fair approximation additional unlawful competitive advantage secured by Telex through misappropriation of IBM trade secrets, this being a judgmatical factor not quantified in the direct proof or findings on the trade secret counterclaim but not otherwise taken

* Plaintiffs contend in effect that any such offset would be speculative; that loss placements because of IBM's unlawful actions cannot be retrieved; that the curative effect of pricing provisions as to past impact are minimal within the period of allowed damages; that the injunctive relief does not restore the predatory price cuts, withdraw the prior effect of the FTP lockout nor negate their continuing effect to a measurable extent; that the already protracted delay in progressively building up its projected and formerly realistic market share as a result of IBM's suppression cannot now be made up; that the prohibition of future unlawful manipulation of prices or such lockout cannot reverse the effect of the past actions in view of lead time, and building, manufacturing, financing and other problems attributable to IBM's conduct and already effective, and that the results of the injunction, as important as they may be, will be largely long range relating to future products not yet marketed by either IBM or Telex. The court already has limited the effect of plaintiffs' future market projections in determining damages to further minimize the bearing of the injunctive relief upon damages awarded. Yet upon consideration of the post-judgment motions I have found that there will be an appreciable effect by the injunctive relief in reduction of actual damages otherwise recoverable, as above determined.

into account in my determination of actual antitrust damages. Accordingly, after deducting these factors and in view of all of the other circumstances heretofore considered by the court as reasonably bearing upon plaintiffs' damages, it is found that $86.5 million represents a fair and reasonable approximation of plaintiffs' actual antitrust damage proximately caused by the unlawful conduct of defendant as herein found.

VIII

Equitable Relief on Antitrust Claims

F125. The court further finds that defendant threatens to, and will unless restrained by the following equitable relief, continue its unlawful conduct to the irreparable injury of plaintiffs and of the industry and the public generally, but with the damage and equitable constraints herein provided it is likely that such further injury can be avoided. To reestablish and maintain competitive environment in the market, IBM's ability to exert monopoly market power and control the plug compatible industry and particularly the relevant submarkets for magnetic tape products, disk products, printer products, memory products and communication controllers should be limited by the following equitable relief.

F126. IBM should be enjoined for a period of three years from the date of this judgment from entering into or enforcing any contractually specified termination charges or liquidated damages which it otherwise might be entitled to collect because of termination of any long term lease agreement entered into between IBM and any of its end-user customers, with respect to IBM EDP peripheral products that are cable connected to any IBM CPU or its channel.

F127. IBM should be enjoined and required in good faith to make available on request, at the time of first customer shipment of an IBM CPU or its channel, information describing the design of the electronic interface for such product (including

the details necessary to describe the characteristics, timing and sequencing of all signals to be interchanged, together with the function of such signals and the expected response to such signals transferred at the interface between such IBM CPU or its channel and the EDP peripheral products cable connected to it) and, in the event that a subsequently shipped IBM EDP peripheral product changes that interface, IBM should be required to make changes in the above information available at the time such product is shipped.*

F128. IBM should be enjoined and required to continue to price separately those System 370 memories which are not a single product with the central processing unit.**

F129. IBM should be enjoined and required to price separately its separate EDP products, including but not limited to CPU's, memories (as set forth in paragraph F128), tape products and their controllers, disk products and their controllers, printer products and their controllers and communication controllers.

F130. Where it offers a separate EDP peripheral product cable connected to an IBM CPU or channel in a separate box and a substantially equivalent version made from substantially common parts integrated into another product, IBM should be enjoined and required to continue to price the integrated version separately from the product into which it is integrated, and should be further enjoined and required to make a good faith effort to set its prices for both such versions with a substantially equivalent profit objective, and with cost and profit objectives being measured on an equivalent basis.

F130a. Neither paragraph F128, F129 nor F130 hereof is intended to require the separate pricing of anything which would not be regarded as a separate product pursuant to Section 3 of

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* The parties and the Court shall use, as an aid in construction of this provision, the IBM Manual GA 22-6794-1: IBM System/360 and System/370 I/O Interface Channel to Control Unit Original Equipment Manufacturers' Information.

**See Findings 110, 111 and Conclusion 31.

the Clayton Act and provided further in this connection that the court does not intend to inhibit technological changes which may alter the definition of what today may be a separate product.

F130b. IBM should be enjoined from adopting, implementing or carrying out predatory pricing, leasing, or other acts, practices or strategies with intent to obtain or maintain an illegal monopoly in a relevant market for EDP peripheral equipment plugs compatible to its CPU's, or any relevant submarkets thereof, in violation of Section 2 of the Sherman Act.

F130c. The foregoing injunctions are intended to be effective only within the United States. They and any changes, modifications or amendments thereof, should be enforced, construed or considered only upon motion duly made by The Telex Corporation, Telex Computer Products, Inc., or International Business Machines Corporation, or their successors in interest, and such motions should be made on at least twenty days' written notice.

F131. Since I have found evidence insufficient to establish that IBM actually implemented with monopolistic intent or without reasonable cause suggestions made internally that as a competitive strategy it withhold from the public existing, available and developed technology relevant to specific product announcements to frustrate plug compatible competition, and because it is believed that any requirement that IBM describe all product enhancements that are planned or anticipated to be made to a product during its product life would be competitively unreasonable and inhibiting to technological developments in the industry, requested injunctive relief in this respect should be denied. Nor do I believe the evidence warrants the order of divestiture sought by plaintiffs, it being my view that the damages and equitable relief abovementioned in connection with normal corrective trends in the industry, will serve to obviate the found monopoly and to restore a healthy competitive climate within a reasonable time, if the enjoined acts and conduct are discontinued or carried out, as the case may be.

IX

IBM's Counterclaim Against Telex for Unfair Competiton, Misappropriation of Trade Secrets and Proprietary Information

F132. Telex's first plug compatible tape drive, its Model 4700, was offered to the market in 1966 to compete with IBM Model 729, which had then been on the market for a number of years. Telex's second plug compatible tape drive, its Model 4800, was delivered to the market in 1967 to compete with IBM Model 2401, which had been on the market for several years. Telex's next plug compatible tape drive, its Model 5420, was delivered to the market in December, 1970, to compete with IBM Model 2420 which had then been on the market for more than one year. Telex's current tape drive subsystem, being its Model 6420/6803-1, was delivered to the market in November, 1971, to be plug compatible to the IBM channel interface of the System 360, which had been on the market since 1964. This model was likewise competitive with IBM tape drive subsystem Model 3420/3803, which had been announced by IBM in November, 1970. Telex's plug compatible disk drive, its Model 5311, was delivered to the market in 1969 to compete with IBM Model 2311, which had been on the market for about five years. Telex's next disk product was a disk drive subsystem, its Model 5314, which was plug compatible to IBM CPU's and was delivered to the market in April of 1970. The said model was competitive with IBM Model 2314 which had been on the market since 1965. Telex's current disk drive system, its Model 6330/6830, was delivered on the market in October of 1972, to compete with IBM's Model 3330/3830, which had been announced in June of 1970 and first delivered in August of 1971, since which date it had been on the market. Telex also manufactures and markets semi-conductor main memories which are plug compatible to IBM CPU's. These were first offered in November of 1971. IBM offers a variety of main memories with which the Telex products com-

pete. Telex also manufactures a plug compatible printer system, its Model 5403/5821, which was offered on the market in November, 1970, to compete with IBM Model 1403N1/2821, which had then been on the market for several years.

F133. As already found, Telex's business has been largely directed toward offering plug to plug interchangeable replacements for products manufactured by IBM. The lower prices by which Telex induces such customers to replace IBM equipment with Telex equipment are achieved by copying as closely as possibile the IBM design. In order to maximize its return on investment, Telex has attempted to bring its plug compatible replacements to the marketplace as soon after IBM announces its products as possible. The life cycle of the Telex plug compatible products is dependent on the life cycle of IBM products to an important measure since Telex generally has not marketed products of independent design but rather has waited until IBM has designed a product which Telex plans to replace. Telex has been motivated to determine the specifications and plan for new IBM products as soon as it is able and, if possible, before the products are announced to the public. One of the ways it has found to implement this objective has been the hiring of IBM employees or former employees.

F134. Statistically, the number of IBM employees hired by Telex has not been impressive. Of those personnel who had formerly been employed by IBM some of them were employed by Telex after intervening employment by third parties and some were employed immediately after the termination of their employment at IBM. On March 31, 1970, Telex employed 50 engineers of whom one was a former employee of IBM. On March 31, 1971, Telex employed a total of 88 engineers, of whom 18 were former IBM employees, 8 of these were employed directly from IBM. On March 31, 1972, Telex employed a total of 145 engineers, of whom 31 were former IBM employees; 13 of these

were employed directly from IBM positions. On March 31, 1973, Telex employed a total of 129 engineers, of whom 12 were former IBM employees; 3 of these were employed directly from IBM. The remainder of Telex's engineering staff was employed after no previous IBM experience. They were obtained either directly from schools or with work experience from self-employment or from some 60 other employers. One of the principal sources of engineering personnel was RCA, which abandoned its electronic data processing venture in 1971; a total of 32 of Telex engineers employed as of March 31, 1973, came to Telex directly from RCA. On March 31, 1973, Telex had total employees of 1,929, of whom 152 had former IBM employment experience.

F135. However, it must be recognized, complementary to these figures, that former IBM employees have furnished an important and vital part of Telex technology and business development. In March, 1970, Telex hired IBM employee Jack James who possessed substantial confidential information about IBM's future product plans. At the suggestion of Telex Vice President of Sales, Grant who had worked with James at IBM, Telex contacted James in January, 1970, regarding the possibility of his resigning from IBM and taking a position with Telex. He had been employed as the Systems Requirement and Business Manager for the General Systems Division of IBM and was in a position of responsibility relating to planning for various IBM products and services. In the course of his duties at IBM, James had access to confidential data relating to IBM products under development and relating to IBM's forecast and financial information. While James was still an employee of IBM, but considering employment by Telex, he provided Telex Chairman Wheeler with an appraisal of the wisdom of Telex's entering into the marketing of terminal products and with advice as to what types of products Telex should offer in the future. After returning from a meeting with Telex executives, James returned to IBM and collected a

substantial quantity of IBM planning data, including shipment forecasts, with respect to IBM products as to which Telex offered plug compatible replacements and, in addition, with respect to IBM's printer products. James was offered the position of Vice President of Finance for Telex Computer Products, Inc., and accepted that position in March, 1970.

F136. James had no contract with IBM for a fixed term of employment and had made no agreement not to accept employment from a competitor of IBM; but he understood that he should not disclose IBM's secret or confidential information or documents, and prior to his leaving IBM he had a termination interview in which his obligations with respect to IBM trade secrets and business confidential information such as marketing analysis, product costs and plans for potential new products were discussed. On March 23, James acknowledged these obligations in writing.

F137. It was natural, proper and to be expected that James's general knowledge of electronic data products, both of IBM and its competitors, his knowledge of the markets existing therefor, or anticipated to exist therefor, his knowledge of price performance factors, of equipment available in the market, and his acquaintance with sales and marketing problems relating to such equipment, including competitive factors, were the currency of his qualifications for any position he might accept. It was natural and proper, also, that his general knowledge and opinions respecting the then existing future markets for electronic data processing equipment, and even limited general notes of information or opinions respecting the fields of his employment which he had made as a part of his work experience, would be carried with him into any future employment. Beyond this, it might have been reasonably expected that he would utilize in his new employment the totality of his general knowledge concerning the EDP industry, his general judgment based upon the sum total of

his experience and his experience and competence derived from dealing with the problems and plans of his former employer, IBM.

F138. But beyond this, I am compelled to find from the evidence as a whole that Telex expected, and James intended as a part of his new employment, to capitalize and exploit confidential IBM documents and studies themselves. Prior to leaving IBM James had access, among other things, to IBM's Plan 25 Forecast and IBM's SCAN forecast assumptions. James knew that the Plan 25 Forecast and the SCAN Forecast assumptions were IBM confidential documents and entitled to protection as such. He took with him from IBM to Telex confidential information copied from the Plan 25 Forecast and from the SCAN Forecast assumptions, including information on IBM Forecasts, IBM product announcements and information about the performance of its products. Beginning immediately after he joined Telex, James prepared and disseminated to other top officials of Telex a series of Memoranda which disclosed the IBM confidential information in his possession relating to unannounced IBM products and to IBM future business plans and projections, which disclosures were in detail and specific, negating any idea that they constituted merely general information or opinions based upon his experience. Beginning in March, 1970, based upon IBM confidential information with respect to peripheral equipment to be attached to the NS series of CPU's later announced as System 370, Telex adopted new business and product plans. On March 26, 1970, James told Martin of his intent to revise Telex's budget based upon "new market forecast—information that should result in higher projections of revenue, profit and cash requirements and a constant or slightly reduced expense picture." On April 15, 1970, a two day off-site business planning meeting was held by Telex's four top officers to discuss "financial analysis of present products and growth strategy". The material which provided the

basis for the discussions at the meeting was confidential IBM market forecast and product information prepared by James and disseminated just prior to the meeting. The materials which James prepared consisted of forecasts of installations of IBM CPU's and certain IBM and Telex peripheral products in the United States and overseas for the years 1970-1975, together with recommended product strategies based on IBM forecasts. The SCAN forecast assumptions and the IBM Plan 25 forecast to which James had access and utilized for the benefit of his new employer were registered IBM confidential documents. The designation "registered IBM confidential" indicates a specially controlled document containing highly sensitive trade secrets for IBM's confidential information.

F139. In the ensuing months James disclosed further IBM confidential information which was used in forming Telex's product strategy and in determining Telex's development program. On June 11, 1970, James proposed to TCP President Martin that Telex enter the business of offering plug compatible replacement memories for NS Systems. James's recommendation was based on his knowledge of the unannounced prices for NS memories and confidential forecast data with respect to those products. On July 20, 1970, President Jatras reported to Telex's board of directors that Telex had just adopted the objective of offering plug compatible memories for IBM systems. Telex officers and employees thereafter engaged in a concerted effort to recruit IBM memory engineers and to discover technical and business confidential information through that recruiting process, to gain access to proprietary documents locked in cabinets under the jurisdiction of IBM's maintenance personnel and otherwise to obtain proprietary information concerning IBM's NS or System 370 memories. On June 15, 1970, James provided Martin with an assessment of "the IBM printer strategy and my opinions on how Telex should counter". This strategy was based on James's knowledge of unannounced printers and card products being developed at IBM and the planning assumptions for those products. On June 15, 1970, four days after his memorandum on memory programs and the date of his memorandum on printer strategy, James provided Martin with an assessment of IBM's "Aspen Intermediate" tape drive and controller development program and a recommendation as to the direction Telex's development program should take. Based at least in substantial part on the disclosures by James of IBM business confidential information with respect to tape, disk, memory and printer products developed by IBM, Telex took a series of actions in 1970 designed to add comparable products to its product line and thereby reduce the competitive advantage to IBM of conducting independent research and development efforts. By the end of 1970, the Telex product line was becoming significantly broader and more competitive than it had been at the end of 1969.

F140. The court finds that James deliberately misappropriated IBM confidential information and made that information available to Telex, and that principal officers of Telex knew, or should have known, that the information made available to Telex was confidential IBM information and that it had been wrongfully misappropriated by James.

F141. Beginning with the hiring of James and continuing at least until commencement of this lawsuit, Telex followed a practice of acquiring as an important part of its business IBM confidential information and trade secrets through the hiring of IBM employees with knowledge of such confidential information and trade secrets. In July, 1970, Telex hired Howard Gruver from IBM with the intent of obtaining confidential information concerning IBM's unannounced advance tape subsystem, Aspen. In November, 1970, Telex hired John K. Clemens with intent to obtain IBM's confidential information concerning its advanced disk subsystem, Merlin. In or prior to November, 1970, Telex

obtained a copy of the Registered IBM Confidential document, the Storage Products Five Year Plan. In May, 1971, Telex acquired a copy of portions of the IBM confidential document 27RN Communications Control Unit Phase I Forecast Assumptions. Prior to July 6, 1971, Telex furnished a copy of the Storage Products Five Year Plan to McDonald who prepared a technical report for Telex based on that document. In June of 1972, James ordered former IBM employee Kevill to provide him with product descriptions and market forecasts for unannounced IBM advanced disk products and Kevill complied with that request. In August, 1972, James ordered Jones to hire IBM employees to build a device patterned after Birch, an unannounced IBM product. About six months prior to March 6, 1973, Telex's President James sent to Howard Gruver IBM confidential information concerning the forecast assumptions for the Storage Products Five Year Plan. During 1971, Telex made a copy of the IBM Friend 2 source diagnostic program, a confidential IBM diagnostic tool.

F142. In April, 1970, at a business planning staff meeting, Telex decided to proceed with a tape controller program and as the first action it determined to "identify and recruit from IBM a project engineer with tape controller experience and 'Aspen' capability". In January, 1971, Wheeler reiterated his prior order to hire a manager for Telex's memory system program from IBM. He noted that Telex would benefit in that "in our efforts to employ the right man we will unquestionably learn what IBM is planning to do in this area which will be a great assistance to us in planning our future strategy." Desmond Jones told Martin that one of the prerequisites for a Telex Memory System's manager was previous active participation in the design phases of IBM's System 370 memory, and Martin then instructed Jones to hire a memory manager with IBM System 370 memory design experience. In August, 1971, in assessing the hiring of Moore, Telex's Desmond Jones noted as a positive factor that Moore

had knowledge of IBM's future plans. An important factor in the consideration of the employment of IBM engineer Roosseim was that he had had the experience designing the IFA for the System 370/145. Grant in 1972 said that Telex must have the IBM talent in the disk area in order to stay current, and on another occasion recommended to James adoption of a hiring policy making "IBM competence a prerequisite" to employment. In June, 1972, Telex employee Deck noted that in the area of advanced disk development "clearly it is most desirable to get IBM or ex-IBM talent . . . The only viable alternative is talent from independent disk and head companies who are cognizant of IBM's plans". In June, 1972, Desmond Jones wrote to Jack James that he had undertaken to recruit the necessary talent to answer questions regarding the functional definitions of various disk programs. Jones stated that "I do feel the need for IBM talent has become considerably more important since we are trying to compete against yet-unannounced products. Thus we will most certainly concentrate on getting IBM talent for not only the disk, but for the memory, advanced tape, and software programs." In a June 8, 1972, disk program proposal, Deck stated, among other things, that "what we are after is not skill per se but information. The best source of people with required information is current or recent employees of IBM's disk development group". Bangel, in a memorandum to Desmond Jones in regard to Blunk, noted that "Telex has a requirement for the type of experience Blunk has had at IBM. Those areas where I feel he could aid Telex are as follows: 1. 370/158-168 memory design; 2. compatible main frame design; 3. backup support to present 370 memory design; 4. recent knowledge of IBM plans and design schemes." In September, 1972, Jones wrote to James concerning the employment of IBM engineer Glen Day. Jones was interested in Day because of his IBM experience with a new terminal. Jones said, "As yet this product has not been announced

but from my information today it appears it would contribute a significant part to any communications program and might well give us a jump on IBM."

F143. None of the IBM employees hired by Telex had any contract with IBM for a fixed term of employment nor did they have any agreement or contract not to accept employment by a competitor of IBM. All of them had either expressly contracted to respect IBM's confidential information and trade secrets or had impliedly undertaken to do so by reason of briefings, discussions or general conditions of employment at IBM. Few, if any, of the former IBM employees employed by Telex who testified at the trial or by deposition admitted expressly that they had delivered or revealed IBM trade secrets or confidential information to Telex, and most of them expressly testified by way of summary or conclusion that they had not. But by reason of Telex's massive and pervasive policy, some direct evidence, and overwhelming circumstantial evidence to the contrary, the court must find that in numerous instances IBM's trade secrets and confidential data which it was entitled to have respected by former employees were revealed to, and utilized by, Telex; and that in combination, and by reason of a planned and intended program to this effect, these revelations transcended any acceptable utilization of the employees' general expertise, training, experience and capabilities and constituted an unacceptable program of industrial espionage and unfair competition.

F144. IBM's 3420 tape drive and 3803 tape drive controller were announced in November, 1970, and first shipped to customers in September, 1971. Telex's 6420 tape drives and 6803 tape controller, which were offered as replacements for the IBM 3420/3803, were announced in December, 1970, and first shipped to customers in November, 1971. The IBM 3420 and 3803 had been developed by IBM under the code name "Aspen", beginning in January, 1969. The basic design work on the Aspen technology had gotten underway in 1966. The Aspen control unit and tape drive embodied significant new technology. The innovations in Aspen resulted largely from 17 specific design characteristics which represented trade secrets in combination and, in certain respects as individual components, particularly in their application to tape devices. All 17 of these design characteristics and their combination, as embodied in the Aspen tape drive and controller, were treated and protected as confidential information by IBM. The first intended disclosure by IBM of any of the Aspen design characteristics occurred in November, 1970, when ten of the seventeen characteristics were disclosed by the public announcement of Aspen. This disclosure was of the existence of their features, not their design or method of implementation.

F145. In April, 1970, approximately seven months before the Aspen tape drive and controller were announced by IBM as the 3420 and 3803, James disclosed information about the confidential Aspen program to the management of Telex. On the basis of that information, Telex decided to design, manufacture and market a plug compatible replacement for Aspen. An important method by which Telex intended to design such a product was to recruit away from IBM an engineer who was working on Aspen and to employ him in the designing of an Aspen type product for Telex. In July, 1970, Telex management hired Howard Gruver, the IBM engineer in charge of the Aspen control unit development project, with the intent that he build for Telex an Aspen type control unit using the knowledge and information which Gruver had accumulated at IBM. Gruver was offered a salary of $35,000, a guaranteed bonus of $5,000 and options of 2,500 shares of Telex stock, the total compensation package being more than twice Gruver's compensation at IBM. Gruver knew from the time he was hired that Telex had hired him to take advantage of his Aspen experience and knowledge of IBM's N/S technology and thereby to get a headstart with Telex's replacement for Aspen.

F146. When he joined Telex, Gruver was under an obligation not to disclose any information with respect to the design characteristics of Aspen. On March 15, 1965, Gruver had executed an employee confidential information and invention agreement with IBM. This agreement obligated Gruver not to disclose any IBM confidential information to others either during or after his employment with IBM. Upon leaving IBM, Gruver was informed in an interview and letter, which he acknowledged in writing, of the trade secrets and other IBM confidential information which he was obligated not to divulge. Such trade secrets and IBM confidential information included information concerning IBM's data storage and retrieval technology programs and concepts, head development programs and concepts, and current programs and concepts concerning various aspects of tape handling and processing, and any information regarding products that had not then been announced. In violation of his obligation Gruver used his knowledge of IBM's trade secrets with respect to the design of the unannounced Aspen tape products to design for Telex a replacement version of Aspen.

F147. Largely because of Gruver's disclosure of the IBM trade secrets relating to Aspen, Telex was able to incorporate in its 6420 tape drive and 6803 control unit the design characteristics of the Aspen control unit and tape drive before they were announced by IBM, to announce its 6803/6420 Aspen replacements a month after IBM announced the 3803 tape drive controller and 3420 tape drive, and to deliver the 6803 and the 6420 two months after IBM delivered its 3420 and 3803. Telex's engineering department anticipated the announcement of Aspen several months prior to November, 1970, and by the time of the IBM announcement "had significant development work underway". Gruver told IBM engineer Richard Moore, who was being recruited by Telex, that "he (Gruver) had come to Telex sometime previously and had effectively duplicated the efforts he had—the machine he had

made at IBM, at Telex . . ." Telex Sales Vice President, Grant, informed his sales force on November 6, 1970, the day after the Aspen announcement by IBM, that as a result of having hired Gruver the Aspen announcement "held no technical surprises whatever" for Telex and Telex expected to be able to ship its replacement products very shortly after IBM deliveries.

F148. Telex's 6803 and 6420 development program, which incorporated the 17 Aspen design features above-mentioned, consumed 16 months from the commencement of the product program to the shipment of the first unit in November, 1971, and was accomplished by engineers working under Gruver who did not have extensive expertise or experience for the purpose. IBM's 3803 and 3420 development program consumed 32 months from the commencement of the program to the shipment of the first units in September, 1971, and was accomplished by engineers with extensive tape controller experience. Products such as the Aspen control unit could not have been designed, developed and manufactured by Telex's independent efforts within eleven months after the IBM announcement of Aspen or even within 16 months of Gruver's joining Telex. Telex could not have incorporated into the 6803 design the Aspen design features which had not been announced in November, 1970, by reverse engineering those features in the two month interval between IBM's first customer shipment and Telex's first customer shipment. Since the combination of 17 design characteristics embodied in IBM's Aspen tape control unit and tape drive was the result of numerous trade-offs, the probability that another group of design engineers working independently would arrive at a combination of greater than 10 of those design characteristics would be negligible despite the fact that most of these characteristics in and of themselves and in different and separate context might not be considered secret, innovative or novel, and some embraced techniques well known in other contexts.

F149. The court must and does find that Telex deliberately set out to misappropriate the IBM Aspen trade secrets, hired Gruver as an important step in furtherance of this purpose and succeeded in misappropriating various Aspen trade secrets and incorporating them in the Telex 6803/6420. Notwithstanding that, as hereinabove found, IBM took approximately 16 months longer to develop its Aspen products than Telex took to develop their replacements, I do not think it necessarily follows that Telex saved 16 months in development time because of incorporating into its design program the Aspen trade secrets disclosed by Gruver. Telex apart from any trade secret revelations was entitled to, and no doubt did, benefit by the general expertise, knowledge and knowhow brought by Gruver to his Telex employment which undoubtedly would have facilitated the design and development of the Telex products had there been no utilization of IBM's trade secrets. Moreover, it is a fair inference from the circumstances that Telex, from developing related technology regularly released by IBM and otherwise obtainable had an advantage over the pioneer efforts of IBM. Because of these and other related circumstances, while it could be possible that Telex had the full 16 months time advantage by reason of appropriating IBM's trade secrets, the probability is that the advantage thus improperly secured was between ten and eleven months.

F150. From September, 1971, to December, 1972, inclusive, shipments of 6803 and 6420 units represented a total of 3,561 rental months for 6803's and 9,348 rental months for 6420's. The IBM 3803 rents for $675 per month. Using the 16 month differential, had IBM's 3803's been shipped to those IBM customers rather than Telex 6803's, the 3,561 rental months would have resulted in $2,403,675 in rental to IBM. The average monthly rental price of IBM's 3420 series tape drives is $471.67 per month. The IBM 3420 model 3 rents for $355; the 3420 model 5 rented for $475; the 3420 model 7 rented for $585. Had IBM's

3420's been shipped to those IBM customers rather than Telex 6420's, assuming the 16 month differential, the 9348 rental months would have resulted in $4,409,171 in rental income to IBM. On the last mentioned bases, through the end of 1972, IBM could be deemed to have been deprived of approximately $6,800,000 in monthly rentals of 3803 and 3420 units as a result of the accelerated shipments of Telex 6803 and 6420 replacement units made possible by misappropriation of IBM's trade secrets, as contended by IBM. However, the court is not convinced that loss in that full amount was proximately caused by reason of the factors above-mentioned and other likely variables, but is convinced by what it regards as the preponderance of the evidence that after discontinuing IBM's claims accordingly and considering the entire record bearing upon this element of damage, the defendant was deprived of $4.5 million in monthly rentals of 3803 and 3420 units. Such result is generally confirmed by consideration of sales actually made by Telex of its 6803 controller and its 6420 tape drive during the ten to eleven months period of advantage.

F151. IBM expended approximately $10 million on the development of Aspen from the start of the program in January, 1969, until the date of first customer shipment; Gruver left IBM approximately half way through the development program and took with him a substantial part of the information developed through the first half of the program at a cost of approximately $5 million. By what part of those development costs Telex was unjustly enriched beyond the more specifically proved damages above-mentioned, or, viewed differently, what damages, if any, should be allowed for the Aspen misappropriation on a "standard of comparison" basis, is a difficult problem factually, not to mention legally. In addition to revenue derived from shipping 6803 and 6420 units to users of IBM systems, Telex would have derived an additional indeterminate amount of income from the

marketing of the 6803, and 6420 to companies such as Mohawk, Data Systems, Itel, Formation, Xerox, CDC, and Telefunken, for which figures are not available. There is no doubt that by reason of the improper use of confidential trade secret information of IBM Telex was unjustly enriched to a substantial amount beyond the $4.5 million, but, again, defendant's additional claim of $5 million for unjust enrichment cannot be accepted; it seems more likely that a reasonable amount would approximate, and not in any event exceed, $3 million.

F152. In the first half of 1970, based on IBM information provided to Telex top management by former IBM employee James, Telex made the decision to expand its product line to include disk file subsystems. James provided detailed information to Telex concerning IBM Merlin 3330 and advised that Telex must be in a position to ship a 2314B (Merlin) product by the fourth quarter of 1971 and Telex decided to try and establish an in-house capability to manufacture a 3330 disk system in mid-1970. Thereupon, Telex adopted the plan of identifying and recruiting from IBM key employees who had developed the subsystem for IBM. During the period 1970, and prior thereto, John K. Clemens was the engineering program manager at IBM for the Merlin project. Clemens had assumed full responsibility for this project in April or May of 1969, and was fully informed of all areas of the program including but not limited to manufacturing, sales and forecasts in addition to development and design. Telex offered a large bonus to Clemens to induce him to join Telex and recruit from IBM a development team to build for Telex a Merlin competitive product. On November 22, 1970, Telex and Clemens executed two contracts of employment. Both contracts provided that Clemens would be responsible for the development of a 3330 type disk storage system. The contracts provided for compensation consisting of a salary of $40,000, a bonus based on performance

of $500,000, stock options for Telex stock having total market value of $50,000, authorization to offer $500,000 in bonuses and $300,000 stock options to other employees to be recruited. One contract signed by both Clemens and Telex on November 22, 1970, made the realization of a portion of the $500,000 cash bonus contingent upon delivery of a Merlin system to a Telex customer prior to August 31, 1972. A copy of this contract, signed before copying and again after copying both by Clemens and Telex, was retained by Clemens, under which he operated while at Telex. This contract had no section concerning any new and original design. A second contract signed both by Telex and Clemens on November 22, 1970, made the realization of the $500,000 cash bonus contingent upon delivery of a Merlin system to a TCP customer prior to November 30, 1972. This contract included a section mentioning a "new and original" design as a prerequisite to the bonus and was retained by Telex. The $500,000 cash bonus offered to Clemens by Telex was the largest bonus offered in the history of the company. After hiring Clemens, Telex set out to hire other IBM key engineers on the Merlin disk drive and Merlin controller. Telex offered these IBM engineers extremely large salaries, bonuses and stock options to induce them to join Telex and build a Merlin product for Telex using IBM confidential and trade secret information. The following additional IBM expert employees were hired by Telex for this project: Charlton, Glover, Hancock, Hou, Ice, Kevill, McGuire and Wilson.

F153. The IBM Merlin had been under development for five years before it was announced in June, 1970. The Telex time schedule called for the development of the Merlin drive and controller to be completed in 18 months. Wilmer, a prospective employee with IBM experience, told Jatras and Clemens during a meeting in Jatras' hotel room in Palo Alto that to develop a Merlin system in 18 months was unrealistic and that the only way you could meet such a schedule would be by copying IBM's 3330

Merlin system. Kevill and Hancock indicated to Wade that they wanted him to come to work for Telex and help Telex build an exact replica or copy of the IBM 3830 control unit for a Merlin system. It would have been impossible to have independently developed the Merlin system in 18 months by using only information that was in the public domain or information that was not IBM proprietary and confidential. The information that had been released by IBM in June of 1970, when Merlin was announced, was only a small portion of that which would have been required to develop the Merlin disk drive. Through numerous other similar statements from Telex officers and employees in connection with its recruitment program and from other circumstances it is apparent that Telex was not primarily interested in a new product design or in an advance in the state of the art through technology developed independently, but rather in a Merlin-type device copied from IBM's design through utilization of IBM information.

F154. IBM considered the Merlin program to be a confidential project and expended a great deal of effort to maintain its confidentiality. When Merlin was announced in June of 1970, the basic functional characteristics were disclosed but the design details of how to achieve the characteristics were not announced or made public. All of the IBM employees who were either successfully recruited by Telex or whom Telex attempted to recruit had signed an IBM Employee Confidential Information and Invention Agreement at the commencement of their employment with IBM. All of the IBM employees that Telex successfully recruited from IBM to work on the Telex 3330 Merlin type system were reminded prior to their departure from IBM of the particular information they had had access to while employed by IBM and IBM considered to be proprietary, confidential and trade secret information.

F155. Telex officers were conscious of the trade secret problem and on occasion sought to rationalize or differentiate between manners of acquisition and on other occasions to dissemble. Telex corporation President Jatras informed Wilmer that it was Telex's position that there was nothing unethical or illegal in copying an IBM product unless they took IBM drawings or documents. Jatras had a copy of the complaint in an IBM legal action against Memorex involving alleged trade secrets and assured Wilmer that there was little chance that IBM would be successful in that suit. Kevill and Hancock informed Wade that Telex wanted to build the Merlin control unit in such a way that they would not be sued. Kevill and Hancock told Wade that he would have to disguise the control unit in such a way that it could not be easily proven that it was an exact copy of the IBM Merlin control unit. Kevill and Hancock indicated to Wade that if he were to be sued for copying the IBM Merlin control unit Telex would provide legal support. In form, former IBM employees were told by Telex officials that they were not expected to utilize IBM trade secrets and on occasion they were expressly forbidden to do so; and generally former IBM employees were hired on a specified "condition" that they would not utilize nor employ trade secrets or confidential information of IBM. It is quite apparent from the entire record and the very circumstances of hiring that these latter conditions and directives were largely mere formalizations and protective devices. There is no doubt that a number of the former IBM employees hired by Telex conscientiously endeavored to separate in their minds the detailed confidential and trade secret information of which they had knowledge and which they had retained, from their general competence, and their judgment, expertise and experience of which Telex was entitled to the benefit. But Telex's necessity for such confidential and trade secret information was so manifest, the pressure so great and Telex's program and policy to obtain that information so pervasive during this particular period as to have rendered it difficult if not impossible for engineering personnel to fully protect IBM's trade secrets.

F156. Accordingly, the court finds that Telex deliberately set out to misappropriate the Merlin trade secrets, hired Clemens and other IBM engineers for this purpose, and succeeded in misappropriating a substantial number of those secrets and incorporating them into the Telex 6830, built at the Telex TDAS facility.

F157. The Merlin control unit and disk drive announced by IBM in June, 1970, as the IBM 3830 control unit and 3330 disk drive were the result of a five year development program at IBM, which cost in the neighborhood of $30 million. At the time of announcement six or seven of the features were disclosed but no design information for implementation was included. The design features listed below were largely new in the context of this device, were individually valuable for the purpose and provided in combination a control unit having improved characteristics over any other which had been introduced at that time. A substantial number of these features were confidential and constituted trade secrets in the context of the 3830 and the combination of them in the 3830 was new, innovative and constituted valuable confidential information and trade secrets. These were misappropriated by Telex and incorporated in the Telex 6830 prior to the first customer shipment of the Merlin which was made in August, 1971:

Semiconductor read/write control store
4K (4096) words of control store
Microinstruction word of 32 instruction bits and 4 parity bits
Variable format microinstruction word
Use of 4 format definition bits
Use of 2 field suppress bits
Use of a 4 bit CK field
Eight specific ALU operations
Four specific direct branch conditions
Use of a specific bit to gate the CK field
A technique of adding a field to the data address register
Command retry
Rotational position sensing
Record reorientation

Upper-A microinstruction word format
Lower-A microinstruction word format
Upper-D microinstruction word format
Lower-D microinstruction word format
Error detection and correction capability.

The use of each of these features in the Merlin, and their details, were known to one or more of the following IBM employees hired by Telex from IBM: J. K. Clemens, Robert J. Hancock, Sterling Hou, W. Edward Ice, B. O. Glover, and J. Kevill. The Telex Merlin 6830 disk file control unit produced in 1971 by the Telex TDAS group at Santa Clara, California, prior to delivery to customers by IBM of the first IBM Merlin disk file control unit embodied all of these design features.

F158. It is true that some of these features were in general context neither new, novel, secret nor innovative; but they all had considerable value in addition to their value as separate elements since they represented a design composite which allowed IBM to achieve its goals of the 3830 in terms of cost and performance, and since their use was calculated to put Telex in a position to compete upon a comparable basis of cost/performance. No skilled microprogrammer with no exposure to the IBM 3830 control unit in its specific implementation could have arrived at the same degree of conformity or similarity to the IBM product as did the TDAS 6830 control unit. The control unit design adopted by TDAS for the Telex 6830 disk file control unit was only one of enumerable design choices which could have been selected to achieve this same function. It would not have been possible for Telex to incorporate the precise technical designs previously incorporated in the 3830 without copying those designs.

F159. As a result of its access to and use of IBM's trade secrets with respect to Merlin, Telex was able to develop its 6830 control unit in substantially less time and at substantially lower expense

than would have been the case had it been developed independently. Telex thereby was unjustly enriched. By May 15, 1971, Telex TDAS had completed approximately 60% of the 3830 type disk controller internal processor design. The IBM development effort required between two and three years to reach the equivalent point in the design of the 3830 control unit. In IBM a competent group of engineers with disk drive experience but no prior Merlin experience required six years to develop the Merlin. Telex scheduled the development of an equivalent Merlin system with a competent group of engineers, including selected key people with IBM Merlin experience, in only 18 months through the use of IBM's knowledge of Merlin. The completion of the project by Telex, however, was not accomplished within this period, since Telex's Santa Clara, California, facility, established for the purpose in early 1971, was abandoned in April, 1972. The evidence does not disclose precisely what percentage of the project was then finished, but it seems fair to infer from the evidence that it was more than half completed. In IBM the approximately 6 year development effort on Merlin cost IBM over $30 million. A group of people experienced in Merlin and developing Merlin in 18 months, or even in twice that length of time, would save a substantial amount in development cost; but the saving that could be deemed to flow from the utilization of protectable confidential information and trade secrets by Telex would not be proportional to the time involved, since Telex was entitled to utilize the general expertise and competence of its employees in view of generally developing technology, and this in any event should have substantially reduced the time required for the redevelopment of a Merlin design. Considering the entire record, and by fair approximation, the court finds that as a proximate result of the improper utilization of IBM's trade secrets, Telex saved for itself at least $10 million in its Merlin development costs to the extent that development was completed by April of 1972, and was unjustly enriched

to this amount; by this amount, on a standard of comparison basis, IBM was damaged beyond the sales price Telex received for this and other designs as hereinafter mentioned, there being no better gauge by which to measure IBM's entitlement.

F160. As above indicated the Clemens' Santa Clara group proceeded with its assigned work in design and development of a disk drive controller until April of 1972, at which time it had not been fully completed. At this date Telex abandoned the Santa Clara activity and shortly thereafter the Santa Clara facility was closed, Telex determining to purchase disk drive controllers from Itel Corporation and to market them under the Telex brand. Telex never produced or marketed a disk drive controller manufactured to the design which was in progress at Santa Clara, nor has it since done so. On May 22, 1972, it agreed to sell, and Control Data Corporation agreed to buy, the manufacturing rights to the Telex 6830-type disk control unit, pursuant to a non-exclusive and non-assignable license agreement, together with IBM's FRIEND program source deck hereinafter mentioned for the sum of $500,000. In addition Control Data agreed to pay Telex an additional $36,000 for prototype number 1 and number 2 of the control unit, residual supplies, and shipping, packaging and handling charges. Telex has sought to derive further benefit from the sale of others of IBM's Merlin trade secrets, and there is a reasonable probability that Telex will do so to its further unjust enrichment and to the great further damage of defendant unless enjoined by the court.

F161. "FRIEND" (Version 2) is an acronym for Fast Running Interpreter Enabling Natural Diagnostics. The source code for FRIEND competitively is extremely valuable to IBM and would be of great value to IBM's competitors. The FRIEND program is a diagnostic program used by field engineering and development engineering personnel to assist in the diagnosis, checkout and debugging of various devices in a computing system. It permits

more rapid diagnosis of malfunctions and assists in identifying errors in design. It has been used in the development of various IBM products. The program was developed at the IBM San Jose laboratory prior to 1970, one Findlay having worked nearly two years on the program and having received an outstanding contribution award from IBM for his effort.

F162. Findlay developed FRIEND (Version 2) by writing instructions in programming language intelligible to a human reader. In this form the program is called a "source code". The source code was subsequently translated to an "object code" which is the form of the program that can be utilized by computers. While the source code of a program such as FRIEND can be translated to an object code, the object code cannot be translated to the source code. A printout of the object code of the FRIEND 2 program is nothing more than an unintelligible mass of letters and numbers which only a computer can utilize. The source code for FRIEND, unlike the object code, can be used by development engineers to design and test new products and for other purposes. The source code for FRIEND (Version 2) has always been treated as proprietary and confidential by IBM. Since its completion, it has been stored on a reel of magnetic tape and kept in Findlay's possession. IBM has never released it, and only the object code for this program has been made available to IBM field engineers and those outside IBM's development laboratories.

F163. Prior to leaving IBM to work for Telex, an IBM employee secured a copy of the FRIEND (Version 2) program and brought it with him to Telex. While the circumstantial evidence establishes this fact beyond question, the identity of the employee has not been determined. In the spring of 1971, Neil Glover, then an IBM employee, left IBM to begin work at Telex. Glover and Findlay worked together in the same diagnostic programming group at the IBM San Jose laboratory. Glover in his work had access to the source code for FRIEND (Version 2). Brigitte

deSaint Phalle, then an IBM employee, was hired by Telex in July of 1971. When she arrived at the TDAS facility she was given a source listing and comments of FRIEND. The source listing and comments belonged to Glover. The source listing was in the form of a computer printout. She transferred this printout to a deck of punched cards. When the TDAS facility was closed by Telex, much of the material from TDAS was sent to Tulsa and some of the material in punched card form was placed on magnetic tape. This work was done by John Hasty, a Telex employee. During pretrial discovery Telex produced to IBM a number of reels of magnetic tape. One of these reels identified as "Hasty 003" contained material from the TDAS facility and the first portion of that tape consists of a source listing of the FRIEND (Version 2) program. The source listing of the FRIEND (Version 2) program in Telex's possession was copied from a source listing created by Findlay, as shown by irrefutable circumstantial evidence: Both listings have the same number of pages—54; each of these pages has the same format and the same number of lines; idiosyncratic notations used by Findlay and not generally used by other programmers appear in both listings; spelling errors made by Findlay appear in both listings; the only difference in the listings consists of 22 keypunch errors that appear in the Telex version and normally could have been made in copying. Telex used the source code of FRIEND (Version 2) to help in the design of the controller under development at Telex's TDAS facility, even though the proprietary status of that program was later sold to Control Data Corporation by Telex as part of the May 22, 1972, agreement above-mentioned. The court finds that Telex deliberately misappropriated, used and sold to Control Data this FRIEND (Version 2) source code listing and comments.

F164. Prior to November, 1970, IBM initiated several secret and confidential advanced disk development programs at the IBM San Jose laboratory which were given the code names Winchester,

Iceberg, Apollo and Midas. Except for certain characteristics of the Winchester program which were disclosed as part of the announcement of the disk product as the 3340 in March, 1973, the Winchester, Iceberg, Apollo and Midas development programs have been treated as secret and confidential IBM development programs by IBM, and all departing employees were reminded of this confidentiality.

F165. Beginning in early 1971, Telex began developing products intended to be equivalent to Midas, Winchester and Iceberg, based in part on IBM trade secrets and confidential information solicited and obtained by Telex from its employees who had previously been employed by IBM. Shortly after Telex embarked upon its extensive hiring program, it revised its product calendar to include the 7330 (characterized as the "next generation 6330") which was Telex's planned copy of Iceberg and the 7312 (characterized as a "head in pack; 30 MB/cart") which was Telex's planned copy of Winchester. In early 1972 Telex terminated its 3330 manufacturing activity at Santa Clara. However, Martin ordered Kevill to continue work on the "3330 spindle as a stepping stone for the Midas, Apollo, Iceberg and Winchester type product." It is clear from numerous recruitment activities and Telex's internal communications and documents that Telex's advanced development disk program included future disk products identified as Iceberg, Midas, Winchester and Apollo, and that an important effort of Telex was to obtain not only skill per se but information concerning IBM's confidential plans and designs and that, indeed, Telex did obtain as a result of its efforts from Kevill and others confidential IBM engineering design information, confidential IBM planning information, and confidential IBM pricing information which was used among other things to prepare a Midas-Iceberg cost estimate. During August, 1972, Telex's President James was negotiating a contract with Hitachi, a Japanese manufacturer. One of the inducements Telex proposed to Hitachi was

access to information relating to IBM's unannounced disk programs known to Telex employees. Telex also offered to provide Hitachi with information that would enable Hitachi to design an equivalent to the unannounced IBM Apollo. In these and other ways, Telex has deliberately adopted a continuing policy for penetration of IBM trade secrets and confidential information on unannounced products.

F166. Telex's memory program began in 1970, on the basis of confidential IBM business information, and since then Telex has attempted to obtain additional confidential information and trade secrets of IBM. Telex launched its memory program partly on the basis of information obtained by James from IBM confidential documents. James's recommendations were based to a substantial extent on his knowledge of the unannounced prices and confidential forecast data relating to IBM's NS memories which he disclosed in the June 11 memorandum to Martin. Among the material James took with him when he left IBM was information from registered IBM confidential documents, the SCAN forecast assumptions and the Plan 25 Forecast. The prices disclosed in James's June 11 memorandum for the "NS-2" CPU and its associated memory were identical with the prices contained in the IBM SCAN forecast assumptions. The forecast of total installed NS systems, on which James's projection of memory potential was based, was identical with the forecasts of NS installations contained in the IBM Plan 25 Forecast. IBM employees experienced and knowledgeable in IBM's plans and designs were sought by Telex through the offer of exceedingly liberal salaries and bonuses, in some cases as much as a quarter of a million dollars, if equivalent memories could be produced. Telex's re-recruitment program in the memory field was not signally successful. While it is clear that substantial confidential information was obtained by Telex concerning the IBM memory program, the evidence is insufficient to permit the court to quantify such information. A similar situation exists with respect to Telex's attempts at

misappropriating IBM's trade secrets and proprietary information regarding communications controllers.

F167. There is evidence in the record showing that Telex attempted to recruit, and in several instances did recruit, IBM employees with the intent to misappropriate IBM trade secrets and confidential information concerning IBM CPU's, and that Telex has attempted, and is now attempting, in negotiations and arrangements with Hitachi to capitalize on its ability to obtain IBM confidential information. On November 16, 1972, Telex's representative Demmer, a former IBM employee, represented to Hitachi among other things: "The way to optimize on the benefits of having the IBM knowledge that exists in Tulsa, and also the technical resources that exist in Kanagawa, is to do the basic design of the CPU in Tulsa until such time that the specs are frozen and the first prototype has had some testing to verify this basic design." Joint development efforts are now proceeding as between Telex and Hitachi.

F168. In all of the areas above indicated, where IBM confidential and trade secret information has been sought or utilized by Telex, the line of demarcation between such use and legitimate utilization of the skills, knowledge, judgment and expertise of former IBM employees is often difficult, and on occasion impossible, to delineate with accuracy or assurance. However, in all of the areas discussed above, it is quite clear, and the great preponderance of the evidence shows, that Telex has had the intent to benefit not only from these appropriate elements of utilization but from confidential information and trade secrets which IBM, within the awareness of Telex, has had the right to preserve; and, in the areas where the court has found that the evidence is sufficiently definite to authorize awards to IBM the court believes and finds that the preponderance of the evidence indicates that the utilization of such confidential information and trade secrets knowingly and willfully by Telex, without reference to the other areas of legitimate utilization of personnel formerly employed by IBM, proximately caused and authorized the damages found herein.

X

Statute of Limitations as to the Misappropriation of Confidential Information and Trade Secrets

F169. Resolution of the reserved issue whether the statute of limitations has barred IBM's counterclaims against Telex primarily depends upon the conclusions of law to be set out hereinafter rather than upon facts beyond those already found. However, additional relevant facts must be determined particularly with reference to IBM's claim that Telex fraudulently concealed its utilization of confidential information and trade secrets and thus tolled whatever statutes of limitations may be held to be applicable.

F170. Howard Gruver was hired from IBM as hereinabove mentioned in July, 1970. The first IBM engineer of significance hired by Telex after that time was John Clemens, who was hired in November, 1970. IBM became concerned that if Telex hired a number of key IBM engineers and put them to work on the same project they worked on at IBM there would be risk of disclosure of its trade secrets and confidential information. Accordingly on December 3, 1970, J. D. Kuehler, Director of IBM's San Jose laboratory, wrote to Telex President Jatras concerning Telex's hiring of Clemens. On December 11, 1970, TCP President Martin responded on behalf of Telex to Kuehler's letter to Jatras, and assured Kuehler that Telex intended to develop its own technology from Telex's own, and public, sources. Martin also represented to Kuehler that Telex had instructed Clemens that he was not to bring with him or retain possession of any drawings, specifications or documents belonging to IBM, and that it was not Telex's policy to focus recruitment on any one employer. Martin suggested it would be in the interest of both companies if Kuehler and he were to have a meeting to discuss the matter of recruiting, trade secrets and confidential information in more detail. During the period of time between the letter from Kuehler to Jatras and

Martin's response to Kuehler, Jatras and Clemens were in fact actively recruiting IBM employees Kevin and Hancock and attempting to recruit IBM employee Wilmer. On January 5, 1971, Kuehler wrote Martin and accepted his suggestion that a meeting be held between representatives of IBM and Telex to discuss the potential exposure that might arise from Telex's hiring of IBM engineers to develop a Telex system functionally equivalent to the system they had recently developed for IBM. During the period of time between the Kuehler letter setting up a meeting with Martin and the actual meeting held on February 17, 1971, Telex successfully recruited Mr. Ice and Mr. Hou from IBM to work at TDAS in the development of a Telex product similar to the 3330.

F171. On February 17, 1971, Martin met with Kuehler and R. H. Mattern, Jr., of IBM at the latter's Menlo Park Laboratory. During this meeting Kuehler informed Martin that IBM was greatly concerned when a key IBM engineer who had been in an IBM development program like the Merlin was recruited by a competitor and given an assignment of developing a product compatible to that which he had developed at IBM under the incentive of a performance bonus for meeting extremely tight time schedules. Kuehler stated that such action could deter "independent contributions" and expose individuals to the necessity of using IBM trade secrets and proprietary and confidential information to realize the bonus. Martin informed Kuehler that Telex had recently changed its policy concerning bonuses with regard to performance based on schedules and that Telex with one exception was now using more conventional salary and stock option plans. Martin further told Kuehler that he did not want key former IBM engineers to use IBM's confidential information at Telex and that he had asked engineers when they joined Telex to sign an agreement that they would not bring Telex any documents or drawings of a confidential nature. Martin assured Kuehler among other things that he would make certain none of

the engineers recreated IBM trade secrets or confidential IBM information from memory once they joined Telex. He also indicated that he believed that the percentage of IBM employees with Telex was already too high and that he didn't intend to recruit any more employees from IBM. Kuehler left this meeting with the impression that Martin would follow through with the things he had said.

F172. Contrary to Martin's representation, in April, 1971, Telex hired Neil Glover from IBM, and in September, 1971, Telex recruited and hired Dick Charlton, who was a key mechanical engineer working on Merlin. It was not until the summer of 1971 that Kuehler heard reports that, contrary to Martin's representation, Telex salesmen were telling customers that they planned to deliver a Merlin type subsystem by the first quarter of 1972. At the time said representations were made by Martin, and continuing thereafter, Telex intended to attempt to recruit and hire and in fact did thereafter hire key IBM personnel by offering them large bonuses and stock options, and intended to utilize and in fact did continue to utilize IBM trade secrets and confidential information in conducting Telex business.

F173. Key IBM engineering personnel upon leaving IBM acknowledged that they had had access to IBM trade secrets and proprietary and confidential information during their IBM employment and agreed not to divulge such information despite having prior knowledge that the respective positions they had accepted at Telex required the use of such information to a greater or lesser degree. All IBM employees signed a Confidential Information and Inventions Agreement upon being employed by IBM. Among those so signing were Clemens, Charlton, Glover, Hancock, Hou, Ice, Kevill, and Wilson. By signing such an agreement an IBM employee bound himself not to disclose to anyone outside of IBM or use in other than IBM's business any confidential information relating to IBM's business either during or after

his IBM employment. When a key employee left IBM to join one of its competitors his manager, and usually a patent attorney, conducted an exit interview during which an attempt was made to define the types of trade secrets and confidential and proprietary information the employee had received. That information was documented and during the exit interview reviewed. The employee was told he was free to make any change he desired, after which the information was recorded in a letter to the employee in confirmation of his responsibility of secrecy. Among the recipents of such letters were Charlton, Clemens, Glover, Hancock, and Kevill.

F174. Telex's President James upon terminating employment at IBM to join Telex concealed the fact Telex hired him at least in part to obtain proprietary IBM information and that he knew he would have to use such information to perform his duties at Telex. When James terminated his employment at IBM in March of 1970, IBM was left with the impression that he was solicited for his overall accounting experience and not for any particular proprietary data of which he might be possessed. As part of his termination interview James signed a statement referring to his previous agreement with IBM not to disclose to anyone outside of IBM, or use in other than IBM's business, confidential or proprietary information after his IBM employment without IBM's written permission. IBM under all the circumstances had no reasonable notice or knowledge of the existence of the facts on which the counterclaim is based until within two years of the filing of such counterclaim.

XI

IBM's Further Efforts to Protect Its Trade Secrets

F175. During and following the year 1970, IBM has had significant security measures in place to protect its trade secrets and design information, including magnetic locks on building doors to allow access only to authorized personnel, procedure to control the distribution and use of documents containing IBM

trade secrets of confidential information, designated "Registered IBM Confidential Documents", and signed agreements by which employees undertake not to disclose such information, as well as exit interviews reaffirming the responsibilities of the employee. In the early 1970's it learned that some trade secrets and confidential information, including parts, specifications, drawings and processes, were being stolen by persons other than plaintiffs, and beginning in the latter part of 1970 IBM significantly increased its security measures, including those pertaining to documents, to hardware manufactured within IBM, and to its hardware manufactured outside of IBM.

F176. IBM has been impelled to expend more money on additional security measures by reason of increasing violation of its trade secrets and confidential information by Telex. IBM's System Development Division is spending $2 million a year more than in 1969-1970 on increased security measures. At the IBM San Jose laboratory direct expenditures on increased security precautions such as guards, television cameras, sensors, locks, safes, computer controlled access system, and the like, implemented since November, 1970, have been in the neighborhood of $1 million. The necessity of manufacturing specialized and sensitive parts in view of threats to its security rather than to contract them with an outside vendor has raised IBM's production costs; its additional cost in manufacturing within IBM the Merlin head arm of security reasons has been more than $400,000. The efficiency, essential intercompany communication and morale of IBM's engineering staff have suffered by reason of the more stringent security measures.

F177. Reasonable efforts and precautions to protect trade secrets and confidential information are to be expected on the part of those entitled to their benefit. The expenses of reasonable protection should not be shifted to competitors whose mere existance motivates such protection. But where efforts of a competitor to

unlawfully penetrate trade secrets occasion extraordinary measures for their protection, it is not unreasonable for them to be borne by the party so unlawfully occasioning them. The evidence renders it difficult, if not impossible, to determine what part of the increased cost inaugurated in 1970 by IBM in protecting its trade secret and confidential information was ordinarily expectable expense or occasioned by persons other than plaintiffs, and what part was extraordinary expense rendered necessary by plaintiffs' unlawful activities. The allocation of Telex's fair share of responsibility, again, rests at best upon a judgment of fair approximation in view of all of the circumstances, upon which basis the court finds the fair, non-speculative, minimum amount would be approximately $3 million for increased extraordinary security costs reasonably occasioned by Telex's unlawful activities during 1971 and 1972, together with $400,000 for extra manufacturing costs.

F177-1. The conduct found herein on the part of plaintiffs in violation of defendant's confidential information and trade secrets was planned, deliberate and willful, reasonably justifying the award of punitive damages in the amount of $1 million

XII

Telex Copying of IBM Copyrighted Manuals

F178. In connection with the marketing of IBM's Aspen tape product, IBM prepared, printed, published and distributed a manual entitled "Systems Component Description-IBM 3803/3420 Magnetic Tape Subsystems". The purpose of such manual was to provide a general introduction to the Aspen magnetic tape subsystem for IBM's customers. IBM has a valid copyright covering said manual. Telex has copied this IBM manual. Telex prior to June, 1971, had in its possession and control a copy, or copies, of this manual. In connection with the marketing of its replacement copy of IBM's Aspen tape subsystem, Telex on or about June, 1971, and thereafter, prepared, printed, published and distributed its manual entitled "Systems Component Description—Telex 6803/6420 Magnetic Tape Subsystems". The purpose of such manual was to provide a general introduction to the Telex replacement copy of the Aspen tape subsystem for Telex's customers. This publication was copied substantially in whole from the said IBM manual. Telex has shipped approximately 690 6803/6420 tape subsystems through December, 1972, accompanied by said infringing manual.

F179. Telex has infringed IBM's copyright in the manual "IBM Field Engineering Theory of Operation—2314 Direct Access Storage Facility Model 1 and A series, 2844 Auxiliary Storage Control" four times by copying portions of it in its following four manuals "Model 730 Storage Control Unit, Volume 1—Operation and Service", "Model 728 Storage Control Unit, Functional Description", "Model 728 Storage Control Unit, Volume 1—Operation and Service", and "Model 728 Storage Control Unit Logic Diagrams—Volume 2". In connection with providing maintenance services for its 2314 disk product, IBM prepared, printed, published and distributed a manual entitled "IBM Field Engineering Theory of Operation—2314 Direct Access Storage Facility, Model 1 and A series, 2844 Auxiliary Storage Control". The purpose of the IBM Manual is to provide an understanding of the theory of operation of the equipment to facilitate its maintenance, preventive maintenance, and operation. IBM has a valid copyright covering said IBM Manual. Telex has distributed a manual entitled "Model 730 Storage Control Unit, Volume 1—Operation and Service". Telex has distributed a manual entitled "Model 728 Storage Control Unit, Functional Description". Telex has distributed a manual entitled "Model 728 Storage Control Unit, Volume 1—Operation and Service". Telex has distributed a manual entitled "Model 728 Storage Control Unit Logic Diagrams —Volume 2". The purpose of said manuals so distributed by Telex is to facilitate maintenance, preventive maintenance and

operation of the Telex 5314 version of the IBM 2314 disk subsystem. Telex has exclusive marketing rights to the 5314. Telex's marketing of the 5314 includes providing service to its customers, and Telex in fact provides such service. Portions of said manuals so distributed by Telex are substantially similar to, or identical with, said IBM Manual. Telex has shipped approximately 453 728 Storage Control Units and approximately 24 730 Storage Control Units through December, 1972, accompanied by infringing manuals.

F180. Telex has infringed IBM's copyright in the manual "IBM Field Engineering Theory—Maintenance Magnetic Tape Units 2420 Model 7", three times, by copying portions of it in the following three Telex manuals "5420 Mod 5 and 7 Maintenance Manual", "6420 Magnetic Tape Drive Maintenance Manual", "5420 Mod 5 and 7—Theory of Operation". In connection with the maintenance of its 2420 Model 7 magnetic tape drive, IBM prepared, printed, published and distributed an IBM manual entitled "IBM Field Engineering Theory—Maintenance Magnetic Tape Units 2420 Model 7". The purpose of said IBM Manual is to provide an understanding of the theory of operation of the equipment to facilitate maintenance, preventive maintenance, and operation of the equipment. IBM has a valid copyright covering said IBM Manual. Telex has copied said IBM Manual. Telex prior to April, 1971, had in its possession and control a copy, or copies, of the IBM manual entitled "IBM Field Engineering Theory—Maintenance Magnetic Tape Units 2420 Model 7". In connection with the maintenance of its replacement version of the IBM 2420 tape drives, Telex, in or about April, 1971, prepared, printed, published and distributed a Telex manual entitled "5420 Mod 5 and 7 Maintenance Manual". In connection with the maintenance of its replacement version of the IBM 3420 tape drive, Telex, in or about November, 1971, and thereafter, prepared, printed, published and distributed the Telex manual entitled "6420 Magnetic Tape Drive Maintenance Manual". In connection with the maintenance of its replacement version of the IBM 2420 tape drive, Telex printed, published and distributed the manual entitled "5420 Mod 5 and 7—Theory of Operation". The purpose of these manuals is to facilitate repair, preventive maintenance and operation of the 5420, Telex's replacement version of the IBM 2420 tape drive. Portions of Telex's said Manuals were substantially similar to, or identical with, said IBM Manual. Telex has shipped approximately 933 5420 tape drives and approximately 2,006 6420 tape drives through December, 1972, accompanied by infringing manuals.

F181. Telex has infringed IBM's copyright in the manual "IBM Field Engineering Theory—Maintenance Magnetic Tape Units, 2420 Model 5, 2420 Model 7", twice by copying portions of it in two Telex manuals "5420 Mod 5 and 7 Maintenance Manual" and "6420 Magnetic Tape Drive Maintenance Manual". In connection with the maintenance of its 2420 tape drives, IBM prepared, printed, published and distributed a manual entitled "IBM Field Engineering Theory—Maintenance Magnetic Tape Units, 2420 Model 5, 2420 Model 7". The purpose of said IBM Manual is to provide an understanding of the theory of operation of the equipment to facilitate repair, preventive maintenance and operation of the equipment. IBM has a valid copyright covering said Manual. Telex has copied said IBM Manual. In connection with the maintenance of its replacement version of the IBM 2420 tape product, Telex, in or about April, 1971, prepared, printed, published and distributed a Telex manual entitled "5420 Mod 5 and 7 Maintenance Manual". In connection with the maintenance of its replacement version of the IBM 2420 tape product, Telex in or about November, 1971, and thereafter prepared, printed, published and distributed the Telex manual entitled "6420 Magnetic Tape Drive Maintenance Manual". The purpose of these Telex manuals is to facilitate repair, preventive maintenance and opera-

tion of the 5420, Telex's replacement copy of the IBM 2420 tape drive and the 6420, Telex's replacement copy of the IBM 3420 tape drive. Portions of Telex's said Manuals are substantially similar to, or identical with, IBM Manual DX1720. Telex has shipped approximately 933 5420 tape drives and 2,006 6420 tape drives through December, 1972, accompanied by infringing manuals.

F182. Telex has infringed IBM's copyright in the manual "IBM Field Engineering Theory of Operation Tape Controls—2803 Model 1; 2803 Model 2; 2803 Model 1 and 2", three times, by copying portions of it in the following three Telex manuals, "6803-1 Tape Control Unit Maintenance Manual", "6803-2/3 Tape Control Unit Maintenance Manual", and "Printer System, Tape Adapter Unit". In connection with the maintenance of its 2803 magnetic tape controller, IBM prepared, printed, published and distributed a manual entitled "IBM Field Engineering Theory of Operation Tape Controls—2803 Model 1; 2803 Model 2; 2803 Model 1 and 2". The purpose of the said Manual is to provide an understanding of the theory of operation of the equipment to facilitate its repair, preventive maintenance and operations. IBM has a valid copyright covering said IBM Manual. Telex has copied said IBM Manual. In connection with the maintenance of its replacement version of the IBM 3803 tape controller, in or about November, 1971, Telex printed, published and distributed a manual entitled "6803-1 Tape Control Unit Maintenance Manual". In connection with the maintenance of its replacement version of the IBM 3803 tape controller, in or about January, 1972, Telex printed, published and distributed the manual entitled "6803-2/3 Tape Control Unit Maintenance Manual". In connection with the maintenance of its 5822 tape adapter unit, on or about August 6, 1971, Telex printed, published and distributed a manual entitled "Printer System, Tape Adapter Unit". The purpose of these Telex manuals was to facilitate the repair, preventive

maintenance and operation of the 6803, Telex's replacement version of IBM's 3803 magnetic tape controller, and the repair, preventive maintenance and operation of Telex's 5822 tape adapter unit. Portions of said Telex Manuals are substantially similar to, or identical with, said IBM Manual. Telex has shipped approximately 12 tape adapter units and approximately 690 6803 tape controllers through December, 1972, accompanied by infringing manuals.

F183. Telex has infringed IBM's copyright in the manual "IBM System/360, Disk and Tape Operating System, Assembler Language", by copying portions of it in Telex Manual "Functional Specifications for the Processors Subprogram of the APS Compiler". In connection with marketing its System/360 computer systems, IBM prepared, printed, published and distributed a manual entitled "IBM System/360, Disk and Tape Operating System, Assembler Language". The purpose of this IBM Manual was to provide reference information for customer's employees who were writing programs for System/360. IBM has a valid copyright covering said IBM Manual. Telex has prepared a document entitled "Functional Specifications for the Processors Subprogram of the APS Compiler" portions of which are substantially similar to, or identical with said Manual. IBM has proved no damages with reference to the last mentioned document.

F184. In each of the foregoing instances in which valid copyrights have been found to exist, the corresponding manual contained a notice of copyright in due form and substance and the register of copyright issued a valid certificate of registration complete and regular in form and substance. In each instance where it had been held above that portions of Telex manuals are substantially similar to or identical with the copyrighted manuals, such portions were substantial rather than trivial or *de minimis* and constituted substantial infringements with reference to material of a nature to be entitled to copyright protection, and the

infringements related to both the form and substance of the writing so copyrighted rather than to the mere ideas expressed therein.

F185. Certain of the Telex manuals above-mentioned relate to the Itel/ISS—made 5314 disk drive subsystem and on their face purport to be Itel/ISS publications. Assuming that the actual copying was done by Itel/ISS, that fact would not immunize Telex against the claim of infringement under the circumstances of this case, since these manuals were used to facilitate maintenance, preventive maintenance and operation of the Telex 5314. The evidence shows that Telex has the exclusive marketing rights for the 5314 and provides services as a part of its marketing of that device.

F186. Prior to its filing of the counterclaim herein, IBM did not give Telex specific notice of copyright infringement or request Telex to discontinue distributing its manuals mentioned, although in the course of discovery in these actions IBM informed Telex that it intended to file counterclaims including those for copyright infringement.

F187. Except as hereinabove specifically found, the court has determined that the other counterclaims filed by IBM for copyright infringement have been abandoned and that no damages or other relief can be based thereon.

From the foregoing Findings of Fact the court now makes the following

Amended Conclusions of Law; Discussion

A. *Jurisdiction and Venue*

Conclusion 1. The court has jurisdiction of plaintiffs' claims of violations of Sections 1 and 2 of the Sherman Act, 15 U. S. C. §§ 1 and 2, and Section 3 of the Clayton Act, 15 U. S. C. § 14, by reason of 15 U. S. C. § 15. The court has jurisdiction of the defendant's counterclaims for violations of its trade secrets and confidential information, unfair competition and copyright in-

fringement by reason of the diversity of citizenship between the parties within the contemplation of 28 U. S. C. § 1332, and pursuant to 28 U. S. C. § 1338 concerning copyrights and unfair competition. The court also has jurisdiction over the persons of all of the parties. Venue of this action is properly laid in the Northern District of Oklahoma by reason of 15 U. S. C. § 22 and the defendant's transaction of business there.

C2. The defendant concedes, and the court finds and concludes, that the commerce involved herein is interstate commerce and that the commerce requirements of Sections 1 and 2 of the Sherman Act and Section 3 of the Clayton Act have been satisfied.

B. *Antitrust Claims—Monopolization*

C3. In applying antitrust laws, especially to new or novel situations of the nature presented here, courts should be especially sensitive to their broad policy, mindful of economic realities in the marketplace, hospitable to healthy economic practices and developments, inhospitable toward subterfuge and pretense, and practical, as well as vigilant, in avoiding control by mere custom, form, appearance or contrivance. Fair and reasonable business practice should be the watchword, predatory conduct a red flag, considerate judgment the measure, and free and unfettered competition in the spirit of *Northern Pac. R. Co. v. United States* [1958 TRADE CASES ¶ 68,961], 356 U. S. 1, 4 (1958), the large objective:

> "The Sherman Act was designed to be a comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade. It rests on the premise that the unrestrained interaction of competitive forces will yield the best allocation of our economic resources, the lowest prices, the highest quality and the greatest material progress, while at the same time providing an environment conducive to the preservation of our democratic political and social institutions."

C4. As extensive and detailed as it has been deemed necessary to make the foregoing findings for disposition of the case and an understanding of that disposition, and in a sense because of them, it does not appear necessary to document the bases of my conclusions with similar detail, in view of my belief that they rest upon basic antitrust principles that hardly require extension to meet the peculiar circumstances. Nonetheless, related legal problems are numerous and significant; and an effort will be made to indicate the rationale of any such adaptations and to notice some of the rejected contentions of one party or the other that have seemed most persuasive on their face, though indeterminative.

[*Lawfulness of Acquisition of Monopoly Power*]

C5. Defendant says that "to maintain an action under Section 2 of the Sherman Act, plaintiffs bear the burden of establishing, *inter alia*, that there exists some relevant market in which IBM has unlawfully acquired monopoly power—the power to exclude competition and control prices", citing e.g., *Walker, Inc. v. Food Machinery* [1965 TRADE CASES ¶ 71,625], 382 U. S. 172, 177-8 (1965); *American Tobacco Co. v. United States* [1946-1947 TRADE CASES ¶ 57,468], 328 U. S. 781, 785 (1946); and *United States v. E. I. Du Pont De Nemours & Co.* [1953 TRADE CASES ¶ 67,633], 118 F. Supp. 41 (D. Del. 1953), aff'd [1956 TRADE CASES ¶ 68,369], 351 U. S. 377 (1956). Plaintiffs' burden of proof is not subject to question, but the unlawful acquisition of monopoly power is not a *sine qua non* for liability if a lawfully acquired monopoly be unlawfully maintained or attempted. *Walker* was in a limited patent context. *American Tobacco* accepts monopoly intent as being controlling. I find nothing to the contrary in *Du Pont* which through its patent context and the interchangeability rule really found it unnecessary to treat a situation where a lawfully acquired monopoly is unlawfully maintained with requisite

intent. In the context of the present case I subscribe in large part to the statement contained in *National Screen Service Corp. v. Poster Exchange, Inc.* [1962 TRADE CASES ¶ 70,395], 305 F. 2d 647, 651 (5th Cir. 1962) (see also *Poster Exchange, Inc. v. National Screen Service Corp.* [1966 TRADE CASES ¶ 71,815], 362 F. 2d 571 (5th Cir.), cert. denied, 385 U. S. 948 (1966)):

> "Every illegal monopoly is condemned regardless of the circumstances which brought it into existence. The law does not condition its condemnation upon a history of misconduct or baleful practices. Indeed, a position of illegal monopoly may be achieved by enterprise and sagacity [citing *Associated Press et al. v. United States* [1944-1945 TRADE CASES ¶ 57,384], 326 U. S. 1, 65 S. Ct. 1416, 89 L. Ed. 2013 and *United States v. Klearflax Linen Looms, Inc.* [1944-1945 TRADE CASES ¶ 57,407], 63 F. Supp. 32 (D. Minn. 1945).] The symptoms are not always the same. In its common forms, price fixing, price leadership, and exclusion of competitors from the market are criteria of illegality under the act. In any case the real question is whether there is an illegal monopoly. *Gamco, Inc. v. Providence Fruit & Produce Building* [1952 TRADE CASES ¶ 67,219], 1 Cir., 194 F. 2d 484. In practically all cases where a course of conduct is under inquiry, the universal test seems to be whether there is 'any purpose to create or maintain a monopoly.' *Lorain Journal Co. v. United States* [1950-1951 TRADE CASES ¶ 62,957], 342 U. S. 143, 72 S. Ct. 181, 96 L. Ed. 162 (1953); *United States v. Colgate*, 250 U. S. 300, 39 S. Ct. 465, 63 L. Ed. 992, 7 A. L. R. 433 (1919) . . . Ultimately, the courts must decide under the facts in each case the point at which freedom to trade must give way to control under § 2 of the Sherman Act. An individual's freedom to trade in the market is unqualified so long as a monopoly is not sought or enjoyed."

[*Possession, Maintenance, Intent*]

C6. I believe the applicable rule to be that monopolization in violation of Section 2 of the Sherman Act involves two ele-

ments: (1) the possession of monopoly power in the relevant market or submarket and (2) the willful acquisition or maintainance of that power with intent to monopolize, which intent need not be evidenced by predatory practices but which is not to be gathered merely from growth or development as a consequence of a superior product, business acumen or historic accident. See *United States v. Grinnell Corp.* [1966 TRADE CASES ¶ 71,789], 384 U. S. 563 (1966); *United States v. Aluminum Co. of America* [1944-1945 TRADE CASES ¶ 57,342], 148 F. 2d 416 (2d Cir. 1945) (sitting for the United States Supreme Court by certification); *Hanover Shoe v. United Shoe Mach.* [1968 TRADE CASES ¶ 72,490], 392 U. S. 481 (1968) (expressly approving Judge L. Hand's opinion in *United States v. Aluminum Company of America, supra*). Cf. *International Boxing Club v. United States* [1959 TRADE CASES ¶ 69,231], 358 U. S. 242 (1959).

[*Relevant Markets and Submarkets*]

C7. Monopoly power is the power to control prices or to unreasonably restrict competition. *United States v. Grinnell Corp.*, 384 U. S. 563 (1966), *supra; United States v. E. I. Du Pont De Nemours & Co.*, 351 U. S. 377 (1956), *supra; American Tobacco Co. v. United States*, 328 U. S. 781 (1946), *supra*. Determination of a relevant market, from both geographic and product standpoints, is essential to a finding of unlawful monopolization because as assessment of monopoly power is dependent upon such determination. *United States v. Grinnell Corp.*, 384 U. S. 563 (1966), *supra; United States v. E. I. Du Pont De Nemours & Co.*, 351 U. S. 377 (1956), *supra; United States v. Columbia Steel Co.* [1948-1949 TRADE CASES ¶ 62,260], 334 U. S. 495 (1948); *Reynolds Metals Company v. F. T. C.* [1962 TRADE CASES ¶ 70,471], 309 F.2d 223 (D.C. Cir. 1962).

C8. A relevant geographic market is the territorial area in which businessmen effectively compete. Competition in the sale or lease of peripheral products plug compatible with IBM CPU's, as well as that in the electronic data processing industry in general, is conducted on a national level by both IBM and its competitors. It is understood that neither side questions this conclusion irrespective of the EDP market or submarket to be defined.

C9. Plaintiffs say that the criteria for determining the boundaries of a relevant product market for purposes of assessing monopoly power under Section 2 of the Sherman Act are the same as those for fixing boundaries of a relevant product market for purposes of Section 7 of the Clayton Act, citing *United States v. Grinnell Corp.*, 384 U. S. 563 (1966), *supra; Case-Swayne Co. v. Sunkist Growers, Inc.* [1966 TRADE CASES ¶ 71,944], 369 F. 2d 449, rev'd on other grounds, 389 U. S. 384 [1967 TRADE CASES ¶ 72,309], see also 355 F. Supp. 408; *Twin City Sportservice, Inc. v. Charles O. Finley & Co.*, 1972 TRADE CASES ¶ 74,150 (N. D. Cal. 1972); *Credit Bureau Reports, Inc. v. Retail Credit Company*, 1972 TRADE CASES ¶ 73,813 (S. D. Tex. 1971); *Marnell v. United Parcel Service of America*, 1971 TRADE CASES ¶ 73,761 (N. D. Cal. 1971); *Rea v. Ford Motor Company* [1972 TRADE CASES ¶ 74,014], 337 F. Supp. 950 (W. D. Pa. 1972). The latter case seems to have no bearing upon the point, but the others cited are persuasive that as indicated in *Grinnell* there is "no reason to differentiate between 'line' of commerce in the context of the Clayton Act and 'part' of commerce for purposes of the Sherman Act." The defendant does not directly challenge this conclusion but has sought to soften the force here of some relevant market cases by emphasizing that they involve Section 7 of the Clayton Act, not Section 2 of the Sherman Act. On the other hand, as hereinafter pointed out, it has cited various Section 7 cases to support its argument of "supply substitutability" as an element in relevant market definition for the purposes of the Sherman Act. In my opinion, while there may be possible differentiation between a "part of commerce" and a "line of commerce" in the solution of some problems that might arise

under the respective acts, no practical distinction would be justified in the context of the present case. Here, as the Supreme Court has done elsewhere, we may look for guidance to each line of cases. Nor need we decide, as suggested by Mr. Justice Clark in the Section 2 case of *Marnell v. United Parcel Service of America, supra,* that the reasonable interchangeability rule of *United States v. E. I. Du Pont De Nemours & Co., supra,* has been refined and modified by the Supreme Court in subsequent Section 7 cases. Whether accepted as modifications or as mere refinements or applications to different states of fact, subsequent decisions of the court must be looked to in the light of the principles of *Du Pont* in determining the present issues. Our task is aided by the more recent cases which explore the new terrain of differing facts which *Du Pont* pointed to without assuming to decide:

> "The varying circumstances of each case determine the result. In considering what is the relevant market for determining the control of price or competition, no more definite rule can be declared than that commodities reasonably interchangeable by consumers for the same purposes make up that 'part of the trade or commerce', monopolization of which may be illegal." (351 U. S. at 395.)

As if to warn against the freezing of applications, the following comment is added in *Du Pont* by its footnote 22 from *Maple Flooring Ass'n v. United States,* 268 U. S. 563, 579:

> "It should be said at the outset, that in considering the application of the rule of decision in these cases to the situation presented by this record, it should be remembered that this court has often announced that each case arising under the Sherman Act must be determined upon the particular facts disclosed by the record, and that the opinions in these cases must be read in the light of their facts and of a clear recognition of the essential differences in the facts of these cases, and in the facts of any new case to which the rule of earlier decisions is to be applied."

C10. The more recent cases teach in new applications of old principles that the term "reasonable interchangeability" should be given a practical application in view of conditions in the marketplace and that while with respect to outer markets a somewhat broad leeway for interchangeability may be indulged, recognition of submarkets within broad markets may be recognized in view of competitive realities, where a lower degree of differentiation may suffice. *Brown Shoe Co. v. United States,* 370 U. S. 294 (1962), *supra; United States v. Grinnel Corp.,* 384 U. S. 563 (1966), *supra; Reynolds Metals Company v. F. T. C.,* 309 F. 2d 223 (D. C. Cir. 1962); *supra; Case-Swayne Co. v. Sunkist Growers, Inc.* [1966 TRADE CASES ¶ 71,944], 369 F. 2d 449 (9th Cir.), rev'd on other grounds [1967 TRADE CASES ¶ 72,309], 389 U. S. 384 (1967); see also 355 F. Supp. 408 (C. D. Cal. 1971), *supra; Power Replacement Corporation v. Air Preheater Co., Inc.* [1973-2 TRADE CASES ¶ 74,658], 356 F. Supp. 872 (E. D. Pa. 1973); *Marnell v. United Parcel Service of America,* 1971 TRADE CASES ¶ 73,761 (N. D. Cal. 1971); *Credit Bureau Reports, Inc. v. Retail Credit Co.* [1972 TRADE CASES ¶ 73,813], 358 F. Supp. 780 (S. D. Tex. 1971), aff'd [1973-1 TRADE CASES ¶ 74,449], 476 F. 2d 989 (5th Cir. 1973). See *Southern Blowpipe & Roofing Co. v. Chattanooga Gas Co.* [1966 TRADE CASES ¶ 71,759], 360 F. 2d 79 (6th Cir. 1966); *Twin City Sportservice, Inc. v. Charles O. Finley & Co.,* 1972 TRADE CASES ¶ 74,150 (N. D. Cal. 1972); *United States v. Aluminum Co. of America* [1944-1945 TRADE CASES ¶ 57,342], 148 F. 2d 416 (2d Cir. 1945), *supra.* See also *United States v. Paramount Pictures* [1948-1949 TRADE CASES ¶ 62,244], 334 U. S. 131, (1948). Thus, it has been variously held that in fixing relevant product market boundaries there may be differentiations between virgin ingot and secondary ingot; first run motion pictures and subsequent run motion pictures; promotion of championship fights and the promotion of non-championship fights; accredited central station protection services and non-accredited central station pro-

tection services, local alarm systems and other onsight protection services; replacement elements for air preheaters and the air preheaters themselves; gas ranges and electrical ranges; major league baseball concessions and concession services for other large spectator sporting events, including professional football, basketball or horse racing; regularly scheduled and consolidated retail delivery service and all other forms of delivery services for retail establishments; and non-local credit reporting, life and health insurance reporting, fire and casualty insurance reporting and personal reporting. Even products that are physically identical or fungible are not necessarily to be grouped in the same relevant product market if, in fact, they are marketed to different classes of customers and are separately treated as of different commercial value by end-users. *Reynolds Metals Co. v. F. T. C.*, 309 F. 2d 223 (D. C. Cir. 1962), *supra;* (decorative foil and florist foil). Inquiry should focus on the practical business realities of the marketplace and not on mere economic theory. *Brown Shoe Co. v. United States, supra.* "A meaningful definition for the relevant market must focus on what the buyers do and not upon what the sellers do, or theoretically can do." *Credit Bureau Reports, Inc. v. Retail Credit Co., supra.*

C11. The defendant has sought to bolster its position with reference to demand or use exchangeability or elasticity with the argument of "supply substitutability"; indeed, its economic expert placed prime reliance upon such a theory. Defendant argues that "supply substitutability between two products exists where the producer of one product can within a reasonable period of time devote his resources to production of the other product" and that "where such a condition exists, a producer has no power to exclude competition and its power over the price of its product is limited by these alternative sources of supply." It cites *United States v. Columbia Steel Co.* [1948-1949 TRADE CASES ¶ 62,260], 334 U. S. 495 at 510-11; *FTC v. Procter & Gamble Co.* [1967 TRADE CASES

¶ 72,061], 386 U. S. 568, 580-1 (1967); *United States v. Penn-Olin Co.* [1964 TRADE CASES ¶ 71,147], 378 U. S. 158, 174 (1964), and *United States v. El Paso Gas Co.* [1964 TRADE CASES ¶ 71,073], 376 U. S. 651, 658-9 (1964), and could well have added along the same line the late case of *United States v. Falstaff Brewing Corp.* [1973-1 TRADE CASES ¶ 74,377], 410 U. S. 526 (Feb. 28, 1973). The latter case cites most of the authorities now relied upon by defendant, but renders it clear that what is there being talked about is not the Section 2 concept of exchangeability or substitutability but the effect of a potential competitor upon "the edge of the market" in negating the desirability of its merger in a Section 7 case. This is a much more diffused inquiry than the one with which we are concerned although the two are related. In *United States v. Penn-Olin Co.*, 378 U. S. 158 (1964), *supra,* a joint venture was attacked by the government as being in violation of Section 7 of the Clayton Act. The distinction between these kinds of cases and the present one well appears from the court's emphasis upon the critical circumstance that in Section 7 cases it must be concerned not only with whether companies would probably have entered the market but also whether the joint venture eliminated the potential competition of a company that might have stayed on the edge of the market threatening to enter it. It is plain that *United States v. Columbia Steel,* 334 U. S. 495 (1948), *supra,* another Section 7 case, is also essentially different. Here we are not concerned per se with mere risks or probabilities that others might enter a market but what effect this and other circumstances actually had upon competition at a given time as a matter of reality in the marketplace. To argue broadly, as does the defendant that, since the same general technology is involved in all EDP products and all manufacturers are capable in time and with sufficient inducement to enter every part of the market, there can be no submarkets is glorifying a theory of supply substitutability beyond reality. It as well could be said that in any part of commerce there can be no geographical limits to a market because

manufacturers outside of it, although not actually competitors in the limited market, theoretically could enter it if the inducement were high enough. The next step of apparent logic would be to say that there could be no monopolization of any market because theoretically if an alleged monopolist raised prices high enough other manufacturers would retool, or come in from distant areas, and restore competition in response to increased inducements. We cannot accept this contention of IBM in its full breadth, but supply substitutability must be and has been recognized to the extent that it has been shown by the evidence to have influenced actual competitive conditions in any market.

C12. No proper application of the criteria of substitutability, exchangeability or elasticity supports the defendant's position that we are concerned with only a single relevant market consisting of "electronic data processing services and equipment." Moreover, such a general classification in the realities of the marketplace and on the record before this court would be designed to render Section 2 of the Sherman Act relatively innocuous and ineffective and would permit the defendant with impunity to continue to monopolize and attempt to monopolize a relevant market and submarkets one by one by unilateral predatory action until the entire industry could be irreparably demoralized. It would be a gross, sweeping and invalid generalization to say, as IBM contends, that it "is engaged in the manufacture, sale and lease of data processing systems and that such economic power as it may have is determined by all the competitive factors affecting the market of such systems . . . because of the variety of equipment and services which may be used to serve a particular data processing function and the variety of functions which said services and equipment can serve . . .", and "because the various devices which comprise a data processing system are to a large degree built from common electronic and electro-mechanical components and can be manufactured by application of an essentially common technology and production facilities."

C13. Having determined on the facts that the relevant market for the purposes of this case cannot be reasonably considered to be the EDP, CPU or general systems markets in general, and that the EDP peripheral market as a whole is not an economic entity or market within which real, measurable or meaningful competition exists, the legal basis for tying a market concept to the products of a single manufacturer merits further discussion. Every manufacturer, of course, is the sole producer of its own particular product or product line and certainly not every manufacturer has an illegal monopoly with regard to the product or product line that it manufacturers. But a manufacturer's product or product line may constitute a relevant product market for the purpose of Section 2 if in the realities of the marketplace widespread competition has been developed around it as a separate economic entity recognized and acted upon by the manufacturer, competitors, and end-users as such. *United States v. Aluminum Co. of America*, 148 F. 2d 416 (2d Cir. 1945), *supra*, (sole domestic producer of virgin aluminum); see *Deterjet Corp. v. United Aircraft Corp.* [1962 TRADE CASES ¶ 70,567], 211 F. Supp. 348 (D. C. Del. 1962) (sole domestic producer of a hydromatic propeller system); *United States v. Klearflax Linen Looms, Inc.* [1944-1945 TRADE CASES ¶ 57,407], 63 F. Supp. 32 (D. Minn. 1945) (sole domestic producer of linen rug materials). And components of a manufacturer's product or product system and their direct competition may constitute a relevant product market. *Calnetics Corporation v. Volkswagen of America, Inc.* [1972 TRADE CASES ¶ 74,095], 348 F. Supp. 606 (C. D. Cal. 1972); *Power Replacements Corp. v. Air Preheater Co., Inc.*, 356 F. Supp. 872 (E. D. Pa. 1973) [1973-2 TRADE CASES ¶ 74,658]. *Deterjet Corp. v. United Aircraft Corp., supra.* To treat defendant's peripheral products as immune from separate market consideration in view of the competition focused upon them would recognize an immunity in favor of IBM from the operation of

the antitrust laws akin to that it unsuccessfully sought in a tying framework, since here also, as will be presently noted, it has avoided the proscription of Section 3 of the Clayton Act in predatory action equally anti-competitive. See *International Business Machines Corp. v. United States* [1932-1939 TRADE CASES ¶ 55,112], 298 U. S. 131 (1936).

[*Submarkets*]

C14. Having determined that the relevant market for appraising IBM's market power in this case is the market for peripheral EDP products plug compatible to IBM CPU's or their channels, it is now necessary to determine whether the plug compatible peripheral EDP market can or should be subdivided in appraising IBM's market power. Applying criteria gathered from the cases cited in light of *Grinnell* and *Brown Shoe*, it is concluded that the sale and lease of disk, tape, printer, memory and communication controller type peripheral products that are plug compatible with IBM central processing units are separate and distinct relevant submarkets forming parts of the plug compatible peripheral EDP market and within which IBM's market power must be appraised. In these markets I have found that while the business of leasing companies involving the separate lease or sale of such plug compatible peripherals should be included, the systems business of leasing companies should not be. This is a correlation of the finding that general systems or CPU's are not a part of the relevant market or submarkets with which we are concerned. Each of these types of plug compatible products performs a basically unique and distinct function when utilized with an IBM CPU. In the case of memories, disks and tapes, the storage capacity, data rate, access time, media or lack thereof, storage of media, cost and consequent cost performance and customer utilization of each type of device is sufficiently distinct so that the distribution of each type of device constitutes a separate relevant product submarket. Particularly should this be recognized under the circumstances as shown by the record. In the sophisticated complex, and organized maintenance and attempted extension of its dominant position, IBM separately focused its market analyses and competitive responses upon and against this limited market and these several submarkets with resulting concentrated impact. It would be neither realistic nor consistent with the policy of the antitrust laws to ignore the severance and separability of these fields of competition or in more broadly defined markets to leave the dominant power free to sharpshoot at essentially separate and distinct components and to eliminate them one by one shielded, as IBM claims the right to be, by lack of control of the entire EDP market. The very contention of IBM that it should be free to launch the "competitive responses" of the predatory nature appearing here against its plug compatible competition merely because it may not have equivalent market power in the general systems market seems a confirmation of its monopolistic intent in the narrower markets. Nor do we think it to be any valid objection to the sub-classification that it involve competition on the one hand of a single corporation; IBM's activities are as varied, extensive and significant as those of numerous other corporations combined.

[*Exercise of Power*]

C15. From its found predominant market shares, the court infers and concludes that IBM had and exercised monopoly power in the relevant market and submarkets herein defined. Circumstantial evidence apart from that relating to market share is indicative of IBM's market power in the relevant market and submarkets as they have been defined. Its own strategy, investigations, and planning were premised to an important degree upon the assumption that it had such power. The very predatory intent with which, as already has been found, its strategies were planned, as well as the nature and direction of its competitive responses, strongly suggest a consciousness of market power and

a determination to utilize it to the extent that it was considered this could be done without a breach of its confidential plans or its becoming involved in legal difficulties. This is not to say that there was any ruthless or nakedly aggressive programs contemplated or carried out; anything that was done by way of strategy was sophisticated, refined, highly organized, and methodically processed and considered. But in this day and age such conduct is hardly less acceptable than the naked aggressions of yesterday's industrial powers if unlawfully directed against competition. The organized, selective, subtle and sophisticated approach, indeed, may pose more danger under modern conditions than instantly more obvious strategies.

[*Maintenance of Power*]

C16. The court further concludes that IBM willfully maintained its monopoly power in the relevant product market for plug compatible peripheral products and in the relevant product submarkets for plug compatible disk, tape, printer, memory and communication controller type peripheral products.

C17. The willful maintenance of a defendant's monopoly power does not require that the defendant specifically intend to monopolize—that is, to control prices or exclude competition. *United States v. Grinnell Corp., supra.* Neither the actual exclusion of competitors nor the realization of unreasonably high profits are elements essential to the offense of monopolization. *United States v. Aluminum Co. of America, supra; American Tobacco Co. v. United States, supra.* A specific intent to monopolize is not an essential element of the offense of monopolization. It is sufficient that monopoly power is willfully acquired or maintained as distinct from the growth or development in a consequence of a superior product, business acumen or historic accident. *United States v. Grinnell Corp., supra; United States v. Griffith* [1948-1949 TRADE CASES ¶ 62,246], 334 U. S. 100 (1948);

United States v. Aluminum Co. of America, supra. To be "willfully maintained" it is not essential that monopoly be accomplished by unreasonable restraints of trade or predatory practices. *Hanover Shoe v. United Shoe Mach., supra; United States v. Grinnell Corp., supra; United States v. United Shoe Machinery Corp.* [1953 TRADE CASES ¶ 67,436], 110 F. Supp. 295, aff'd *per curiam* [1954 TRADE CASES ¶ 67,755], 347 U. S. 521 (1954); *United States v. Aluminum Co. of America, supra.* Such practices, of course, coupled with monopoly power may underscore and often characterize the offense of monopolization but it is not necessary to monopolization that market power be maintained by "maneuvers not honestly industrial". *United States v. Aluminum Co. of America, supra.* The requisite willful maintenance can result from acquisitions, *United States v. Grinnell Corp., supra,* loans, *Twin City Sportservice, Inc. v. Charles O. Finley & Co., supra,* the construction of new capacity to absorb consumer demand, *United States v. Aluminum Co. of America, supra,* or discriminatory leasing arrangements in extension of patent rights, *Peelers Company v. Wendt* [1966 TRADE CASES ¶ 71,921], 260 F. Supp. 193 (W. D. Wash. 1966). And the unlawful maintenance of a monopoly can be accomplished, as here, also by the maintenance or raising of prices on CPU's and lowering prices on plug compatible peripheral products against which the most threatening challenge to an existing monopoly position had arisen and through long-term leases with punitive termination provisions to cut the new order rate of plug compatible competitors for a time by almost half.

[*Skill, Foresight, Industry*]

C18. Correspondingly, the court concludes that such maintenance of IBM's monopoly power in the relevant product market for plug compatible peripheral products was not the result of IBM's superior skill, foresight, or industry and was not the result of superior products, business acumen or historic accident. To an

extent, it was its failure, as IBM itself recognized, to develop new technology and superior performing products as rapidly and effectively as it had hoped, and the capability of plug compatible manufacturers to keep abreast of, and in limited instances surpass, some of the technological developments that jeopardized its monopoly position in the relevant product market, and that motivated it to undertake predatory pricing and long term leasing to stem the growth of its plug compatible competitors.

[*Obsolescence and Tying*]

C19. Plaintiffs contend that in addition to the unlawful conduct above-mentioned there were "technological obsolescence through mid-life kickers" and the "tying" of its peripheral products, including memories and control units, to its CPU's which were similarly predatory. While, as already observed, there is some evidence that actions which might be so characterized were designed to help stem the growth of its plug compatible competition, we conclude that predominant evidence demonstrates that they really represented technological advancements, a desire to make available in the market improved devices at the earliest practicable time even though other improvements were contemplated as soon as they could be developed and other legitimate efforts that cannot be fairly regarded as predatory within the contemplation of antitrust policy.

[*Youth of Industry*]

C20. Defendant points out that "the youth, growth and technological change of the electronic data processing industry render improbable the acquisition of monopoly power" and that the "quality of economic performance . . . in terms of consumer satisfaction, product innovation and price reduction is indicative of competition and not monopoly power." If it were not for the more direct and persuasive evidence to the contrary, and the fact that technological dynamics in this remarkable industry are adaptable to dynamic antitrust programs and effects also, these considerations would be persuasive. But antitrust applications and interpretations must not be inextricably tied to entrenchments of long standing when the monopolization can be accomplished in modern context and particularly in such industries as the EDP industry by fast acting strategies and sophisticated selectivity. In this sense, the dynamics of the industry and the intent of IBM may be more relevant than market shares: ". . . It is true that innovation in products in certain industrial areas where the rate of innovation —and consequently of obsolescence—is rapid, market share is essentially irrelevant to a judgment of market power." *United States v. Columbia Steel Company* [1948-1949 TRADE CASES ¶ 62,260], 334 U. S. 495, at 527-8. It is no answer to say that this industry is the youngest in which monopolization has ever been found because it might also be said that here rewards from monopolization may be among the highest and the opportunity in view of its rapid technological and market developments perhaps among the greatest.

C. *Attempt to Monopolize*

C21. Should I be in error in the precise delineation of the relevant market and submarkets or mistaken in my view of the general systems business of leasing companies as interchangeable or elastic parts of these markets and submarkets, I am of the opinion, nonetheless, and so conclude, that attempted monopoly has been clearly made out by plaintiffs with like effect.

[*Market and Probability of Success*]

C22. I do not agree with plaintiffs that in an attempt to monopolize case it is unnecessary to establish either the relevant product market or that the attempt involves a dangerous probability of success. Little if anything is found in several of the cases cited by plaintiffs, *United States v. E. I. Du Pont De Nemours &*

Co., supra, at 395 n. 23; *United States v. Grinnell Corp.,* [1964 TRADE CASE: ¶ 71,298], 236 F. Supp. 244 (D. C. R. I. 1964), aff'd, *United States v. Grinnell Corp.* [1966 TRADE CASES ¶ 71,789], 384 U. S. 563 (1966); *Union Carbide and Carbon Corporation v. Nisley* [1962 TRADE CASES ¶ 70,222], 300 F. 2d 561 (10th Cir. 1961); *United States v. Consolidated Laundries Corporation* [1961 TRADE CASES ¶ 70,039], 291 F. 2d 563 (2d Cir. 1961), reh'g denied [1961 TRADE CASES ¶ 70,093], 291 F. 2d 576; and *Rawlins v. American Oil Co.,* Civil Number C-89-67 (D. Utah 1969) (appeal dismissed by reason of settlement), to support plaintiffs' view on this point. *Lessig v. Tidewater Oil Company* [1964 TRADE CASES ¶ 70,993], 327 F. 2d 459 (9th Cir. 1964), and *Industrial Building Materials, Inc. v. Interchemical Corp.* [1971 TRADE CASES ¶ 73,399], 437 F. 2d 1336 (9th Cir. 1970), also cited by plaintiffs, are in point by broad expression but are not convincing in view of subsequent decisions of the Ninth Circuit, *Bushie v. Stenocord Corp.* [1972 TRADE CASES ¶ 73,896], 460 F. 2d 116 (9th Cir. 1972); *Cornwell Quality Tools Co. v. C. T. S. Co.* [1971 TRADE CASES ¶ 73,620], 446 F. 2d 825 (9th Cir. 1971), and for other reasons. The Tenth Circuit case of *Union Carbide* and my *American Oil* perhaps are explainable by the absence therefrom of any focus upon, or determinative importance of the point there.

C23. In any event, the great weight of current authority supports the relevant market and dangerous probability tests in attempts to monopolize cases. *Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp.* [1965 TRADE CASES ¶ 71,625], 382 U. S. 172 (1965); *American Tobacco Co. v. United States* [1946-1947 TRADE CASES ¶ 57,468], 328 U. S. 781 (1946); *Agrashell Inc. v. Hammons Products Company* [1973-1 TRADE CASES ¶ 74,446], 479 F. 2d 269 (8th Cir. 1973); *Bernard Food Industries Inc. v. Dietene Co.* [1969 TRADE CASES ¶ 72,883], 415 F. 2d 1279 (7th Cir. 1969), cert. denied, 397

U. S. 912 (1970); *Central Savings and Loan Ass'n v. Federal Home Loan Bank Board* [1970 TRADE CASES ¶ 73,092], 422 F. 2d 504 (8th Cir. 1970); *Hiland Dairy Inc. v. Kroger Co.* [1968 TRADE CASES ¶ 72,611], 402 F. 2d 968 (8th Cir. 1968), cert. denied, 395 U. S. 961 (1969); *Kansas City Star v. United States* [1957 TRADE CASES ¶ 68,601], 240 F. 2d 643 (8th Cir. 1957); *Dobbins v. Kawasaki Motors Corporation* [1973-2 TRADE CASES ¶ 74,609],—F. Supp.—(D. Or. No. 71-105, June 15, 1973).

C24. Mr. Baker, Director of Policy Planning for the Antitrust Division of the Department of Justice, told the American Bar Association last year:

> "Monopolization is basically a structural offense and therefore relevant market and position in it are important considerations. Attempted monopoly is basically a conduct offense; and, where we are dealing with conduct which is clearly predatory and unfair, there is no public policy reason for protecting it from judicial sanction. To eliminate the 'dangerous probability' and 'market' requirements from Section 2 attempt to monopolize cases would make it a much more effective tool for dealing with indefensible single firm conduct." Vol. 5 CCH TRADE CASES ¶ 50,145 at p. 55,247.

Even the Department position does not suggest a belief that the attempt to monopolize doctrine has already become the "more effective tool" hoped for. It may well be that a complete restatement of the rule of *American Tobacco* is soon due, to reach abuses that thereby may be masked or protected in future context. But in view of the justification and authority for applying the present formalization to the present situation here I shall not assay it. Suffice it to say now that under the presently accepted rule the precise boundaries of relevant markets and the likelihood of success in and of themselves become less important in attempt to monopolize cases as aggressive predatory intent and conduct emerge more clearly. See *Dobbins v. Kawasaki Motors Corporation, supra,* and *Power Replacements Corp. v. Air Preheater Co.,*

Inc., supra. And the precise articulation of the rule is not as important as the idea of likelihood of monopolization if a predatory intent remains unchecked. See *Kansas City Star Company v. United States* [1957 TRADE CASES ¶ 68,601], 240 F. 2d 643 (8th Cir. 1957). In one of the latest cases on the subject, *Power Replacements Corp. v. Air Preheater Co., Inc.* [1973-2 TRADE CASES ¶ 74,658], 356 F. Supp. 872 (E. D. Pa. 1973), the plaintiff alleged among other things that the defendants violated Section 2 of the Sherman Act in connection with the sale of a replacement element in installations of air preheaters. There were no allegations of monopolistic activity in the manufacture and sale of air preheaters themselves. The defendants sold around 90% of all of the regenerative type air preheaters sold in the United States, which were the most successful type, and there was no question that they achieved this position in the market lawfully. The focal point of the case was the competition in the sale of replacement elements for use in the regenerative type of preheaters (Ljungstrom). The court held that "(t)he relevant product market to be used in testing the plaintiff's claim in its lawsuit is replacement element for use in Ljungstrom Air Preheaters". In 1963 the defendant Air Preheater Company had a complete monopoly of the air preheater replacement business (as a result of its manufacture of the preheater itself). The high profitability of its replacement business invited competition. The users of heating elements because of defendants' high prices looked around for competitive alternatives and this was the genesis of plaintiff's business. With plaintiff's entry into the market, the defendants gave immediate attention to pricing strategy, believing that if moderate strategy did not work it was a "big enough operation so that we could beat this competition and whatever other competition might develop in other areas." The share of the market to be expected by plaintiff was predicted by defendants depending on the latter strategies. The defendants forecast of its sales of

the market "was not just a prediction but the percentage it set for itself as a goal". Among other strategies defendants coded their element in view of the previous simple description and this handicapped the plaintiff in working up a bid for potential customers. The court referred to presumption of market control flowing from command of a high percentage of the market in view of the decided cases but added:

> "In the present case, while it has been established that the defendants have managed to maintain approximately 75% of the business known to them, we have not been provided with sufficient evidence to compute precise percentages as to the actual share of the market for each company during each year. This was no comfort for the defendants, however, since we had concluded that Air Preheater's power to exclude the competition of power replacements has been proven directly so that no inference from the market share percentage is necessary . . .
>
> "It is important to note that plaintiff would have proven a violation of Section 2 even if they had not shown that success rewarded defendant's attempt to monopolize. Plaintiffs have had no difficulty in establishing that Air Preheater, while possessing a significant degree of market power, engaged in a course of conduct which was likely to achieve monopoly power, and that also Air Preheater committed certain commercially unfair acts with the specific intent to injure plaintiff and eliminate competition, thereby proving attempted monopolization. See *Times Picayune Publishing Co. v. United States* [1953 TRADE CASES ¶ 67,494], 345 U. S. 594, 73 S. Ct. 872, 97 L. Ed. 1277 (1953); *Lorain Journal v. United States* [1950-1951 TRADE CASES ¶ 62,957], 342 U. S. 143, 72 S. Ct. 181, 96 L. Ed. 162 (1951)."

The court concluded that the defendants violated both Section 2 of the Sherman Act and the Robinson-Patman Act but limited damages because of the insufficiency of plaintiff's proof. The court concluded as to Section 2:

"Without restating the evidence contained in this voluminous record, the sum and substance of our findings of fact number 55 to 81 is that since the latter part of 1965 Air Preheater has willfully attempted to monopolize the replacement element market and that Air Preheater has successfully maintained that monopoly power."

C25. I find the last mentioned case singularly in point, and persuasive not only with respect to the issue of relevant markets based upon the product of a single manufacturer, but covering the effect of proof of predatory conduct on the issue of probability of monopolization. If the old "dangerous probability rule" is to be literally applied, I believe that it can be deemed satisfied by the circumstances established by the record from which sufficient market dominance, organizational capability and determination to control, can be found to render it likely to the point of danger that IBM's program, if unchecked, will maintain or achieve monopolization in the relevant market and submarkets, whether or not the business of leasing companies is included and irrespective of the precise boundaries of any reasonable relevant market or submarkets.

[*Predatory Intent*]

C26. The sum total of all evidence must be considered on the issue of predatory intent, and there is no set formula for such a finding. *Continental Baking Co. v. Old Homestead Bread Co.* [1973-1 TRADE CASES ¶ 74,433], — F. 2d — (10th Cir. 1973). The court is convinced that the sum total of all of the evidence establishes that IBM undertook the 2319A, 2319B, FTP and memory pricing, with specific and predatory intent of suppressing and eliminating its plug compatible competition and that such conduct taken pursuant to this anticompetitive purpose in fact suppressed and eliminated IBM's plug compatible competition to a substantial extent. Each of the price cuts, and in the case of disk drives the 2319B/FTP price cuts upon price cuts, were expressly

formulated, analyzed, planned and aimed by IBM specifically at its plug compatible competition. Tape price cuts were substantial and were below, and were planned to be below, the prices charged by IBM's plug compatible competitors, including Telex, whereas IBM knew that, in order to survive, its plug compatible competition would have to charge less than IBM for comparable products. Price cuts through the FTP were accompanied by long term leases with punitive termination provisions planned to foreclose IBM's plug compatible competition from a substantial share of the plug compatible peripheral market on disks, tape and printers and were planned by IBM to foreclose, and did foreclose, IBM's plug compatible competitors from access to most of the plug compatible market for the new 3330 type disk drives, and 3420 type tape drives. At the time IBM was aiming its price cuts and long term lease plans at its plug compatible competition, it offset those price cuts by price increases in markets in which it was not facing plug compatible competition. Memory price cuts were aimed in important part by IBM at its plug compatible competition and had the effect of substantially suppressing plug compatible competition on these peripheral products. While the so-called control and memory bundling had predominate technological and marketing objectives which in and of themselves cannot be regarded as unlawful, even this action was motivated in part by IBM's anticompetitive intent; but specifically with respect to the memory price cut lack of any such justification rendered this unadulterated predatory action in my opinion. All of these actions were taken by a competitor having a major share of the plug compatible peripheral market and submarkets, of enormous economic size and power and with the studied purpose of containing the competition of its plug compatible competition which was recognized as a threat to its market domination. The record leaves little room to doubt that this course of conduct did not represent normal competitive reactions to be countenanced under Section 2,

but willful conduct with predatory intent. Here, as an analogy to the general law on attempts, there was an effort and intent to achieve, or maintain, an unlawful monopoly, coupled with the apparent present ability to do so, unless checked, in view of the intransigence, skill and organization with which this intent was pursued; and the powerful and resourceful base from which the program was launched.

C27. Thus by unlawful and egregious conduct and with specific intent to maintain and further achieve monopolization under circumstances from which it can be and is fairly inferred that there was a dangerous probability of unlawful monopoly if defendant's conduct remained unchecked, the defendant attempted to monopolize the EDP market for peripheral devices and each part thereof. The court further finds accordingly that defendant has been guilty of violating Section 2 of the Sherman Act not only by monopolization but by an attempt to monopolize.

D. *Restraint of Trade*

C28. Plaintiffs in addition to their claims of monopoly and attempt to monopolize under Section 2 of the Sherman Act assert that under Section 1 of that Act IBM's FTP and ETP agreements with their users covering disks, tapes, printers and communication controllers constituted agreements in unreasonable restraint of trade in violation of Section 1, citing *Albrecht v. Herald Co.* [1968 TRADE CASES ¶ 72,373], 390 U. S. 145 (1968). In construing the Sherman Act's prohibition against contracts, combinations and conspiracies "in restraint of trade or commerce among the several states" the courts have long applied a rule of limiting the reach of that section to contracts which unreasonably or unduly restrain trade. *Standard Oil Company of New Jersey v. United States*, 221 U. S. 1 (1911). Every contract may be said to restrain trade to some degree. Applying the "rule of reason" the courts have separated from such ordinary commercial agreements

necessary for the conduct of trade, types of contracts which fall within relatively narrow and increasingly well defined categories deemed unreasonably in restrain of trade either as a matter of law or fact. Contracts and conduct not proscribed by Section 1 may, and in this case do, impinge upon the inhibitions of Section 2. I have concluded that the leases in question would not be unlawful without the monopoly power held possessed by IBM or the found attempt to monopolize.

C29. Agreements reached under IBM's fixed term and extended term plans are commonplace commercial agreements fixing the terms and conditions upon which users may lease some piece of electronic data processing equipment for periods of up to two years. The terms of these leases are limited to provisions governing the use of the particular equipment under lease. They impose in and of themselves no restraints on the freedom of the lessee to trade. They do not obligate the lessee to any exclusive dealing arrangement. They do not obligate the lessee to purchase its requirements of the electronic data processing equipment, supplies or services from IBM. The terms of leases contain no "restraints" of the kind traditionally found violative of Section 1 of the Sherman Act. The terms of the leases are shorter than leases which had been offered by IBM's competitors, including plaintiffs, for some time prior to IBM's adoption of the fixed term and extended term plan. In a different context, the court in *United States v. United Shoe Machinery Corp.* [1953 TRADE CASES ¶ 67,436], 110 F. Supp. 295 at 297, (D. Mass. 1953), aff'd *per curiam* [1954 TRADE CASES ¶ 67,755], 347 U. S. 521 (1954), *supra*, expressly sanctioned the use of five year term leases despite its conclusion that defendant had monopolized the market for shoe machinery. The court concludes that the leases offered by IBM pursuant to the fixed term and extended term plans are not contracts in restraint of trade violative of Section 1 of the Sherman Act.

E. *Integrated Functions as Tying Agreements*

C30. Plaintiffs claim that the integration of additional memory and control functions in certain System 370 central processing units is the basis of, or constitutes, tying agreements or arrangements violative of Section 1 of the Sherman Act and Section 3 of the Clayton Act. Section 3 of the Clayton Act prohibits the sale or lease of goods or commodities, or the fixing of a price or discount, on the condition or agreement that the lessee or purchasers thereof shall not deal in the goods of a competitor where the effect of such sale or lease may be substantially to lessen competition or to create a monopoly in any line of commerce. Section 3 of the Clayton Act and Section 1 of the Sherman Act have been applied to proscribe ". . . the forced purchase of a second commodity with the desired purchase of a dominant 'tying' product," *Times-Picayune Pub. Co. v. United States* [1953 TRADE CASES ¶ 67,494], 345 U. S. 594, 614 (1953), where "a party has sufficient economic power with respect to the tying product to appreciably restrain free competition in the market for the tied product and a 'not insubstantial' amount of interstate commerce is affected." *Northern Pac. R. Co. v. United States, supra,* at p. 6. For purposes of Section 3 of the Clayton Act and Section 1 of the Sherman Act, ". . . a tying arrangement may be defined as an agreement by a party to sell one product but only on the condition that the buyer also purchases a different (or tied) product . . ." *Northern Pac. R. Co. v. United States, supra.* at 5. It is established by these authorities that for a commercial arrangement to be unlawful as a tying agreement under Section 3 or Section 1, there must exist two distinct products the sale of which is linked. This does not mean that a defendant may avoid judicial scrutiny under Section 3 by pretending that two separate and distinct products are one. Nor can tying consequence be avoided if in fact there is a tying agreement, by putting it in the form of an innocuous arrangement but with the effect, by reason of the

products involved, of requiring the purchase of one distinct product as a condition for the acquisition of another. However, where a court is dealing with what is physically and in fact a single product, Section 3 does not contemplate judicial dissection of that product into parts and the reconstitution of these parts into a tying agreement. *Colorado Pump & Supply Co. v. Febco, Inc.* [1973-1 TRADE CASES ¶ 74,297], 472 F. 2d 637 (10th Cir. 1973). Some of the recent cases finding or not finding tying arrangements to be indicated sufficiently explicate the governing considerations to permit disposition of these tying contentions on the basis of the record. *Cole v. Hughes Tool Company* [1954 TRADE CASES ¶ 67,857], 215 F. 2d 924 (10th Cir. 1954); *Dehydrating Process Co. v. A. O. Smith Corp.* [1961 TRADE CASES ¶ 70,069], 292 F. 2d 653 (1st Cir. 1961); *MDC Data Centers v. International Business Mach. Corp.* [1972 TRADE CASES ¶ 74,010], 342 F. Supp. 502 (E. D. Pa. 1972); same [1973-1 TRADE CASES ¶ 74,525], 352 F. Supp. 63 (1972); *United States v. Jerrold Electronics Corp.* [1960 TRADE CASES ¶ 69,784], 187 F. Supp. 545 (E. D. Pa. 1960), aff'd *per curiam* [1961 TRADE CASES ¶ 69,960], 365 U. S. 567 (1961). Cf. *Jerrold Electronics Corp. v. Wescoast Broadcasting Co.* [1965 TRADE CASES ¶ 71,364], 341 F. 2d 653 (9th Cir.), cert. denied, 382 U. S. 817 (1965); *City Sportservice, Inc. v. Charles O. Finley and Co., supra; Stavrides v. Mellon National Bank & Trust Company* [1973-1 TRADE CASES ¶ 74,327], 353 F. Supp. 1072 (W. D. Pa. 1973); *McMackin v. Schwinn Bicycle Company* [1973 TRADE CASES ¶ 74,559], 354 F. Supp. 1154 (N. D. Ill. 1973); *Falls Church Bratwursthaus v. Bratwursthaus M. Corp.* [1973 TRADE CASES ¶ 74,408], 354 F. Supp. 1237 (E. D. Va. 1973); *Anderson v. Home Style Stores, Inc.* [1973-1 TRADE CASES ¶ 74,534], 358 F. Supp. 253 (E. D. Pa. 1973). See also *International Business Machines Corp. v. United States* [1932-1939 TRADE CASES ¶ 55,112], 298 U. S. 131 (1936).

C31. Control of memory function has been integrated with processing functions over a long period of time in varying degrees. Technological progress in component miniaturization has made possible the integration of additional memory and control functions and such additional integration has made possible cost reductions and enhanced utility. The integration of which plaintiffs complain involves in form or substance no tying of the sale or lease of one product to that of another. To rule otherwise would enmesh the courts with technical and uncertain inquiry into the technological justifiability of functional integration and cast unfortunate doubt on the legality of product innovations in serious detriment to the industry and without any legitimate antitrust purpose. The integrated control in the System 370 is wholly optional. IBM continues to offer central processing units without integrated controllers. Customers remain free to lease such processing units and to lease independent controllers from IBM, Telex, or whomsoever they choose. The court concludes that the integration of additional controller and memory functions in the System 370 central processing units does not constitute a tying agreement violative of Section 3 of the Clayton Act or Section 1 of the Sherman Act.

C32. Nor do IBM's Fixed and Extended Term Plan leases constitute tying agreements in violation of Section 3 of the Clayton Act or Section 1 of the Sherman Act. It has already been determined that these plans were unlawfully utilized by the defendant with intent to maintain and protect its monopoly control and in this sense they were illegal. Acts which are in themselves legal lose that character when they become constituent elements of an unlawful scheme. *Continental Ore Co. v. Union Carbide & Carbon Co.* [1962 TRADE CASES ¶ 70,361], 370 U. S. 690 (1962). However, apart from the offenses of monopolization and attempts to monopolize under the circumstances of this case nothing can be seen in the leases in and of themselves which would constitute

a tying arrangement within the prohibitions of Section 3 of the Clayton Act or Section 1 of the Sherman Act. They did not require the lessees to lease any other equipment from IBM. They did not impose any exclusive dealing obligations on the lessees. They did not require the lessees to secure their requirements of data processing services or equipment from IBM. The leases contain no covenants which directly or inferentially impose any tying restrictions on lessee. The facts that the Fixed Term and Extended Term plans apply to some but not all of the data processing equipment and services does not effect a tying restriction. A lessee of a piece of IBM equipment pursuant to the Fixed Term or Extended Term plan remains free to select whatever other data processing equipment or services he desires without any contractual restriction. The fact that his choice is limited to equipment compatible with his requirements and may be influenced by the type of other equipment he may independently have does not in my judgment transform the lease into a tying agreement. The fact that a lessee can lease IBM equipment under the Fixed Term or Extended Term plan at a price which is lower than that offered under the IBM's 30 day lease does not transform such plan leases into tying agreements, this situation having become significant only in connection with the monopolization or attempted monopolization findings. The fact that the reduced prices offered may induce a user to utilize IBM equipment and that this utilization will affect his decision concerning other equipment he may wish to use does not establish a tying agreement in my judgment. A user's choice of equipment is inevitably affected by equipment he is currently using and limited by the alternatives which the industry can make available. To rule otherwise might serve to transform most leases of a producer's goods into a tying agreement. The court concludes that leases entered into pursuant to IBM's Fixed Term and Extended Term Plans do not constitute tying agreements violative of Section 3 of the Clayton Act or Section

1 of the Sherman Act, notwithstanding their utilization in violating Section 2 of the Sherman Act.

F. *Injury and Damage from Antitrust Violations*

C33. Recovery under the Sherman Act is limited to a person who has been "injured in his business or property by reason of" violation of the antitrust laws. 15 U. S. C. § 15. The plaintiffs have the burden of proving that they have in fact been injured and that the injury was caused by the defendant's unlawful conduct. They are required to establish with reasonable probability a casual connection between defendant's allegedly wrongful acts and some loss of anticipated revenue. If all of a plaintiff's loss is caused independent of any unlawful act of a defendant by such factors as lawful economic competition in the marketplace, *Dollac Corporation v. Margon Corporation* [1958 TRADE CASES ¶ 69,170], 164 F. Supp. 41 (D. N. J. 1958), aff'd, 275 F. 2d 202 (3d Cir. 1960), inefficiency, unfavorable market conditions, or customer dissatisfaction, *E. V. Prentice Mach. Co. v. Associated Plywood Mills* [1958 TRADE CASES ¶ 68,930], 252 F. 2d 473 (9th Cir. 1958), cert. denied, 356 U. S. 951 (1958), or undercapitalization, inefficient operation, or failure of products to meet competitive standards, *Winckler & Smith Citrus Products Co. v. Sunkist Growers, Inc.* [1965 TRADE CASES ¶ 71,476], 346 F. 2d 1012 (9th Cir.) cert. denied, 382 U. S. 958 (1965); or the comparative inferiority of plaintiffs' prices, products or delivery terms, *Herman Schwabe, Inc. v. United Shoe Machinery Corp.* [1961 TRADE CASES ¶ 70,187], 297 F. 2d 906 (2d Cir. 1962), cert. denied, 369 U. S. 865 (1962); or because of lack of financing, *Martin v. Phillips Petroleum Company* [1966 TRADE CASES ¶ 71,845], 365 F. 2d 629 (5th Cir.), cert. denied, 385 U. S. 991 (1966); or because it had no business to be injured, *Denver Petroleum Corporation v. Shell Oil Company* [1970 TRADE CASES ¶ 73,100], 306 F. Supp. 289 (D. Colo. 1969); or the nonexistence

of damage in fact, *Wolfe v. National Lead Co.* [1955 TRADE CASES ¶ 68,094], 225 F. 2d 427 (9th Cir.), cert. denied, 350 U. S. 915 (1955); *Gorham & Johnson, Inc. v. Chrysler Corporation* [1962 TRADE CASES ¶ 70,469], 308 F. 2d 462 (5th Cir. 1962), cert. denied 372 U. S. 912 (1963); or simply bad management, *Dipson Theatres v. Buffalo Theatres* [1950-1951 TRADE CASES ¶ 62,896], 190 F. 2d 951 (2d Cir. 1951), cert. denied, 342 U. S. 926 (1952); *Clark Marine Corporation v. Cargill, Inc.* [1964 TRADE CASES ¶ 71,043], 226 F. Supp. 103 (E. D. La. 1964), aff'd [1966 TRADE CASES ¶ 71,674], 345 F. 2d 79 (5th Cir.), cert. denied, 382 U. S. 1011 (1965), then defendant is entitled to judgment in its favor. Many of these cases, however, involve findings by trial courts which were upheld because not clearly erroneous even though a decision the other way presumably would have been sustainable also; and none of them negates the principle that recovery may be had for loss to which a defendant's unlawful conduct substantially contributed, notwithstanding that other factors may have also contributed. As Judge Doyle aptly stated for the court in *Westric Battery Company v. Standard Electric Co.*, — F.2d — (10th Cir. No. 72-1734, July 6, 1973), an injured party ". . . is entitled to be compensated for losses attributable to the injury inflicted, but is not entitled to earn a profit or necessarily to come out whole because some of its troubles could be attributable to causes other than the defendant's separators. It must be emphasized that it is only the damages flowing legally from the defendant's misdeeds which count." See also *Herman Schwabe, Inc. v. United Shoe Machinery Corp.* [1961 TRADE CASES ¶ 70,187], 297 F. 2d 906 (2d Cir.), cert. denied, 369 U. S. 865 (1962); *Baush Mach. Tool Co. v. Aluminum Co. of America* [1932-1939 TRADE CASES ¶ 55,084], 79 F. 2d 217 (2d Cir. 1935); *Momand v. Universal Film Exchanges* [1948-1949 TRADE CASES ¶ 62,360], 172 F. 2d 37 (1st Cir. 1948), cert. denied, 336 U. S.

967 (1949); *General Electric Credit Corporation v. Grubbs*, 478 F. 2d 53 (5th Cir. 1973).

C34. Mindful of plaintiffs' burden and various limitations and qualifications, and recognizing that many of Telex's financial difficulties have resulted from the inherent nature of its business of producing products functionally equivalent to those first produced by IBM, competition by firms other than IBM, delay in the introduction of new products, product performance, managerial errors, resistance to its penetration of IBM trade secrets, and operational difficulties to be expected in the industry, yet in my judgment the preponderance of the evidence before me, referred to in my findings, compels the conclusion that IBM's unlawful conduct in violation of Section 2 of the Sherman Act has had not only substantial but severe impact upon the plaintiffs' business and that this impact is established with certainty adequate to satisfy plaintiffs' burden of proving impact or injury. With respect to the amount of plaintiffs' damages the evidence is not as clear. The court recognizes that an antitrust plaintiff has no obligation to prove his damages with absolute certainty. A plaintiff does, however, have the burden of offering evidence upon which the court reasonably may base its damage conclusions, having in mind that the defendant should not be permitted to capitalize upon the effect of its unlawful acts in rendering precise damage computations difficult, nor should the plaintiffs be awarded damages which are merely speculative.

[*Approximation of Damages*]

C35. The court, having concluded that the defendant has violated Section 2 of the Sherman Act and that by reason of such violations and as a proximate result thereof the plaintiffs Telex and Telex Computer Corporation have been caused damage in their business and property, is called upon to make a reasonable approximation of the damages to which plaintiffs are entitled if

and to the extent that there is evidence in the record reasonably permitting this. *Zenith Radio Corp. v. Hazeltine Research* [1971 TRADE CASES ¶ 73,484], 401 U. S. 321 (1971); *Bigelow v. RKO Radio Pictures* [1946-1947 TRADE CASES ¶ 57,445], 327 U.S. 251 (1946); *Continental Baking Company v. Old Homestead Bread Co.* [1973-1 TRADE CASES ¶ 74,433], — F. 2d — (10th Cir. 1973); *Kobe, Inc. v. Dempsey Pump Co.* [1952 TRADE CASES ¶ 67,312], 198 F. 2d 416 (10th Cir.), cert. denied, 344 U. S. 837 (1952). As was stated in the *Continental Baking* opinion:

> "However, in cases such as this the courts have repeatedly and consistently held the plaintiff to a lower standard of proof than he is nominally required to make . . . 'The most elementary conceptions of justice and public policy require that the wrongdoer shall bear the risk of uncertainty which he has all along created' [*Bigelow v. RKO Radio Pictures, Inc., supra*] . . . This position was recently reaffirmed by the Supreme Court in Zenith . . . It has been otherwise stated: 'Having best established the factum of damages, the amount thereof may be fairly approximated . . .'" *Continental Baking Co. v. Old Homestead Bread Co., supra.*

C36. The court may measure loss of profits by use of projections or forecasts of future business made in the regular and ordinary course of business, *Autowest, Inc. v. Peugeot, Inc.* [1970 TRADE CASES ¶ 73,392], 434 F. 2d 556 (2d Cir. 1970). I have found that the damage evidence adduced by Telex is insufficient to support the full amount of its claim based upon the Telex forecasts. The relation between its claim for $257.7 million in lost profits or diminution of market share and any action of IBM involves difficult questions quantitatively and corresponding problems of law. Plaintiffs' claims rest upon the November, 1970, forecast which, as the court has found, involves some questionable features, and projected a higher total than any other forecast by

Telex for those products. The January 12, 1972, forecast, against which the earlier forecast was compared, was the lowest forecast Telex ever made for the selected products. The November, 1970, forecast was revised downward almost immediately and the January, 1972, forecast would have required a compound annual growth of 67% which was beyond the ability of Telex to have achieved, in the court's judgment. Moreover, the computations of Telex's damage witnesses, based on the two forecasts, assume that every variation in the number of units forecast were caused by the unlawful actions of IBM. The evidence as to other components of plaintiffs' damage claims also have required weighing and evaluating, as has been done in the findings with the factual results indicated therein. It is believed that these factual determinations, along with the other findings made, are supported by substantial, indeed, preponderating evidence.

C37. Fluctuation in Telex's stock market prices on the basis of which Telex asserts that $149.9 million in damages is indicated is equivocal as proof of damages proximately resulting from IBM's unlawful action, but is supportive to a degree. There is substantial reason for attributing at least a part of this loss to other causes. The court has determined also that Telex's attempt to compare earnings for different periods on the basis of information shown in tax returns must be carefully weighted because of the distinctions between the application of the principles of tax accounting and other generally accepted accounting principles, the differences in Telex's own method of tax and financial accounting and certain inconsistencies in Telex's comparison of 1971 and 1972 taxable income revenues and expenses. In addition, it is apparent that Telex's 1971 and 1972 tax returns cover subsidiaries, divisions and transactions not involved with Telex's domestic EDP business. Telex's income statements do not afford any precise basis for damage computations because they fail to match revenues with expenses in accordance with customary accounting principles and reflect a significant change in Telex's accounting methods

effective April 1, 1970, together with a number of fluctuations due to causes which are extraneous to this litigation and unrelated to the competitive behavior of IBM; but, again, they do not appear to be inconsistent with the findings made here.

C38. I have been unable to accept plaintiffs' damage figures on their face as indicating the amount to which they are entitled; it is clear that a portion is attributable to causes for which IBM has no accountability and that they are magnified, if not distorted, by the circumstances indicated. It is equally clear that plaintiffs have sustained serious impact and have suffered substantial damages proximately caused by the unlawful conduct of IBM as herein found. In short, plaintiffs have claimed too much, and they have failed to directly prove what part of their claimed damages was caused by acts for which defendant is legally responsible. But because of the complicated damage picture, resulting in important part from defendant's unlawful action, it is unlikely that any more specific damage evidence could be submitted short of plaintiffs' conceding the excessive nature of its claims and introducing expert testimony or other evidence seeking to sustain its claims on a more moderate and realistic basis.

C39. The question remains whether these circumstances preclude any and all recovery by the plaintiffs or whether the court upon the basis of the evidence before it can reasonably approximate plaintiffs' damages for which the defendant is legally responsible. Juries frequently are called upon to make reasonable approximations within the perimeters of parties' claims, and it has not been thought fatal to their verdicts that the amount awarded did not precisely correspond with the claims or expert testimony, but represented an acceptance of the claims in part. The judgment of a court sitting without a jury, to put the matter modestly as an opinion of a court, should be at least as perceptive and fair in weighing the various points and counterpoints with

reference to the amount of damages. Notwithstanding the obligation of a court sitting without a jury to make findings of fact beyond a general verdict, it has been concluded here that detailed and minute findings weighing and allocating portions of claims going to make up the finding of the ultimate fact of damage would be a mechanical process which would be unrealistic and of no more validity, if as much, as finding by fair and reasonable approximation in the judgment of the court the total damages which the court is convinced the plaintiffs have suffered as a direct and proximate result of the unlawful acts of the defendant. *Story Parchment Co. v. Patterson Parchment Paper Co.*, 282 U. S. 555 (1931); *Agrashell, Inc. v. Hammons Products Company* [1973-1 TRADE CASES ¶ 74,446], 479 F. 2d 269 (8th Cir. 1973); *Continental Baking Co. v. Old Homestead Bread Co., supra; Locklin v. Day-Glo Color Corporation* [1970 TRADE CASES ¶ 73,241] 429 F. 2d 873 (7th Cir. 1970), cert. denied, 400 U. S. 1020 (1971); *Devries v. Starr*, 393 F. 2d 9 (10th Cir. 1968). See also *Perkins v. Standard Oil Co.* [1969 TRADE CASES ¶ 72,822], 395 U. S. 642 (1969). Cf. *Continental Ore Co. v. Union Carbide & Carbon Co.* [1962 TRADE CASES ¶ 70,361], 370 U. S. 690 (1962); *Autowest Inc. v. Peugeot, Inc.* [1970 TRADE CASES ¶ 73,392] 434 F. 2d 556 (2d Cir. 1970); *Flintkote Company v. Lysfjord* [1957 TRADE CASES ¶ 68,674], 246 F. 2d 368 (9th Cir.), cert. denied, 355 U. S. 835 (1957); *Shannon v. Shaffer Oil & Refining Co.*, 51 F. 2d 878 (10th Cir. 1931); *Peter v. Union Oil Company of California* [1971 TRADE CASES ¶ 73,650], 328 F. Supp. 998 (C. D. Cal. 1971).

C40. I have endeavored to weigh and consider all of the circumstances as shown by the evidence relating to the amount of plaintiffs' damages with the object of fixing the amount determinable on the basis of a fair preponderance of the evidence, and with the view of discounting any amount which could be deemed speculative or a matter of surmise, or properly deductible expense, but

fixing the maximum amount of damages which can be said without speculation or conjecture to have been suffered by plaintiffs as a proximate result of defendant's unlawful actions as herein found. I have sought to eliminate advantage on the part of the plaintiffs stemming from the speculative nature of some of their proof and yet not to penalize them for uncertainties in the proof stemming from the unlawful acts of the defendant.

C40(a). Damage adjustments have been made as indicated in finding F124 with respect to the probable effect of injunctive relief, and the unlawful competitive advantages secured by Telex through misappropriation of IBM trade secrets. With reference to the first mentioned factor reducing actual damages by $6 million there need be added here only my conclusion that such authorities as *United States v. Oregon State Medical Soc.*, 343 U. S. 326 (1952), and *Florists' Nationwide Tel. Del. Net v. Florists' Tel. Del. Ass'n* [1967 TRADE CASES ¶ 71,965], 371 F. 2d 263 (1967), relied upon by plaintiffs in an attempt to establish that no adjustment at all should be made for possible effects of the injunction, are not in point. Further discussion, however, seems necessary concerning adjustments based upon the effect of my trade secret counterclaim findings against Telex upon the determination of the antitrust damages against IBM. This aspect involves more complicated factual and legal problems to add to the array which already has characterized this unusual suit.

C40(b). I have, as in the findings indicated, deducted from the plaintiffs' damages found before trebling the amount of $17.5 million fixed in my findings on IBM's first counterclaim to be the damages and unjust enrichment caused or enjoyed by plaintiffs as a result of the unlawful misappropriation of defendant's trade secrets* (not including, however, cost of in-

*The items totaling this amount really constitute the only types of quantification of competitive advantage accruing from trade secret misappropriations which IBM suggested at the trial. While this quantification was not then attempted precisely for our present purpose it represents the best figure available in the evidence and I have concluded that it should be used in this connection.

creased security, additional cost of manufacturing the IBM head arm, and punitive damages which have little or no relationship to the subject under discussion). Initially I was, and plaintiffs continue to be, of the view that the subject matter of the first counterclaim and the remedies thereon awarded in the nature of involuntary royalty were independent of the antitrust damages and should simply be set off against them after the latter were trebled, in view of *Perma Life Mufflers, Inc. v. International Parts Corp.* [1968 TRADE CASES ¶ 72,486], 392 U. S. 134 (1968), and *Kiefer-Stewart Co. v. Joseph E. Seagram & Sons* [1950-1951 TRADE CASES ¶ 62,737], 340 U. S. 211 (1951). However, I have concluded that this was error, since plaintiffs' prospective market position to the extent it otherwise would have been recognized in my antitrust damage calculations would have included such competitive advantage and should be adjusted accordingly before plaintiffs' damages are trebled. Other authorities relied upon by plaintiffs to the contrary are inapposite. See *Semke v. Enid Automobile Dealers* [1972 TRADE CASES ¶ 73,892], 456 F. 2d 1361 (10th Cir. 1972), see also [1971 TRADE CASES ¶ 73,451], 320 F. Supp. 445, 446-447 (W. D. Okla. 1970); *Flintkote Company v. Lysfjord* [1957 TRADE CASES ¶ 68,674), 246 F. 2d 368 (9th Cir.), cert. denied, 355 U. S. 835 (1957); *Bal Theatre Corp. v. Paramount Dist. Corp.* [1962 TRADE CASES ¶ 70,385], 206 F. Supp. 708 (N. D. Cal. 1962); *Waters v. Turner*, 76 F. Supp. 279 (E. D. Pa. 1948); *Sampson v. Thomas*, 76 F. Supp. 691 (E. D. Mich. 1948); and *Jerard Associates, Inc. v. The Stanley Works*, 1966 TRADE CASES ¶ 71,820 (D. C. S. D. N. Y. 1966). In these cases the counterclaim or offset amounts were not, as here, directly connected with the evaluation of primary damages. In other contexts, I would agree that there is no justification in law or justice for the treble damage provision of the antitrust laws to be emasculated by artifically trebling a defendant's counter-

claim. But damages cannot be recovered for detriment not based upon the violation of legal rights. *Keogh v. Chicago & Northwestern Ry.*, 260 U. S. 156 (1922); *Okefenokee Rural Electric Membership Corp. v. Florida Power & Light Co.* [1954 TRADE CASES ¶ 67,809], 214 F. 2d 413, 418 (5th Cir. 1954); *Maltz v. Sax* [1940-1943 TRADE CASES ¶ 56,259], 134 F. 2d 2 (7th Cir.), cert. denied, 319 U. S. 772 (1943); *Calnetics Corp. v. Volkswagen of America, Inc.* [1972 TRADE CASES ¶ 74,132], 348 F. Supp. 623 (C. D. Cal. 1972); *Jones Knitting Corp. v. Morgan* [1965 TRADE CASES ¶ 71,579], 244 F. Supp. 235, 239 (E. D. Pa. 1965), rev'd on other grounds [1966 TRADE CASES ¶ 71,772], 361 F. 2d 451 (3d Cir. 1966); *Mason City Tent and Awning Co. v. Clapper* [1965 TRADE CASES ¶ 68,553], 144 F. Supp. 754, 770 (W. D. Mo. 1956). See also, *Columbia Nitrogen Corp. v. Royster Co.* [1971 TRADE CASES ¶ 73,732], 451 F. 2d 3, 15-16 (4th Cir. 1971); *Semke, supra* at 1370.

C40(c). The application of this principle is relatively clean-cut in the cases cited. For example *Calnetics Corp.* involved a single identifiable factor to be eliminated from consideration. *Semke* dealt with enjoined sales. Involved in *Mason City Tent and Awning* was attempted recovery under the antitrust laws for loss of profits from adjudged patent infringements. The principle of these cases has been applied in the complicated setting of the present one through the counterclaim deduction from antitrust damages before trebling to the extent above specified. I have found that there should be deducted also $7.5 million on an analogous theory, representing by fair approximation the additional effect of trade secret advantages not quantified in connection with IBM's counterclaim, not heretofore otherwise taken into account and which unless deducted would distort the antitrust damage determination made by the court. Concededly this is a judgmental process based upon a broad evaluation of the evidence.* But I cannot

*It is hoped that no apology need be made for resorting to human judgment despite rather complete envelopment by a computer climate. In

escape the conviction in review of the antitrust damages as a result of motions directed to the original judgment that account must be taken of this additional factor to the extent indicated. Plaintiffs' contention that this re-evaluation is mere speculation in view of the drastic revision already made to their damage projections is rejected, for my evaluation has extended to a reconciliation of the two aspects in light of the evidence as I have viewed it. Much less am I persuaded, as argued by IBM, that these adjusting factors should be extended to swallow up all antitrust damages to which plaintiffs might otherwise be entitled. In effect IBM would extrapolate from each confidential document, subject, plan or employment, without proof or justification in the court's findings, dire consequences to its own business and unlimited advantage to Telex. I cannot accept the thesis, inferentially though not expressly advanced, that because of the misappropriation of some of its trade secrets, however unjustified or impressive in aggregate, but yet limited in relation to Telex's total business and prospects, IBM became in effect almost the virtual owner of Telex's future despite its victimization by IBM's antitrust strategies. Such an argument in its full reach indeed would do violence to the principle of *Perma Life* and involve a domination of employment, technology and ideas in the EDP industry far beyond anything

post-judgment briefs on quantification problems submitted to it each side seemingly has been able to support its position with a myriad of figures precisely allocated among a wide range of EDP devices, presumably with the aid of the ubiquitous machines. Nonetheless, the prior experiences of both parties, as documented in my findings, may raise some question concerning the infallibility of such processes. IBM's computers taught with little question that its anticompetitive stratagems would be effective in suppression of its plug compatible competition but the judgmental test of the extent to which this properly could be accomplished was represented neither in their input nor output. And Telex's lead time advantage by utilization of IBM's Aspen secrets likely could be computerized quantitatively but not qualitatively. Reversing the process, IBM's utilization of the court's qualitative findings cumulatively of "massive" trade secret penetration by Telex to treat each part or fragment as "massive" and to quantify it as such, is unjustified by the record.

suggested by the evidence.* Moreover, its acceptance would tend to unduly extend if not pervert the state law of trade secrets in the defeat of federal antitrust policy. *Cf. Sears, Roebuck & Co. v. Stiffel Company,* 376 U. S. 225 (1964); *Lear Inc. v. Adkins* [1969 TRADE CASES ¶ 72,823], 395 U. S. 653 (1969); *Kewance Oil Company v. Bicron Corporation,* 478 F. 2d 1074 (6th Cir. 1973). Plaintiffs, as indicated in the findings, had the right to employ the skill, competitive aggressiveness, knowhow, ambition, foresight and planning together with all of the other talents and information of numerous experts hired from other EDP companies, as well as from IBM, and to utilize these to the fullest extent, short of illegal trade secret misappropriations.

*The latest evaluation by the defendant of the effect of trade secret misappropriations seems somewhat an afterthought. No trade secret misappropriation counterclaim was actually pleaded until almost a year after plaintiffs filed their antitrust action against IBM. At a pre-trial hearing, in denying plaintiffs' motion to sever the counterclaim, the court did recognize that in the antitrust phase of the case it would be improper "to draw an iron curtain over their [trade secret misappropriations] exploration, with regard to damages, perhaps with regard to impact and probably with regard to other elements of liability . . ." IBM's amended answer, in twelve pages of denials and averments, contained only one express reference to Telex's violation of its trade secrets, ". . . that Telex has hired, and is continuing to hire, former IBM employees to obtain IBM confidential and proprietary information from such former IBM employees and from others and has thereby copied IBM tape, disk, printer and memory and storage devices and has announced such copies." Its trade secret counterclaim was pleaded as independent of its answer to the plaintiffs' antitrust charges. The court has found in the transcript no evidence offered by IBM as a part of its defense to the antitrust claims directly addressing itself to the quantification of any trade secret misappropriations as against plaintiffs' damages nor, indeed, did defendant's counsel cross-examine the principal witness presenting plaintiffs' damage projections with reference to the relationship itself. The only express mention that I have been able to find in IBM's final argument as to some possible relationship between antitrust damages and the subject matter of the counterclaim is when counsel began his discussion of the counterclaim and said: "Now, Your Honor, I want to turn to the last part, which will be mixed together somewhat: The injury, damages and counterclaim. As a prelude to that let me state a brief chronology . . ." And later counsel added: "Mr. Jatras testified that he believed they were going to the moon; and Telex's business success or failure was hinged entirely upon these products which it had set out to copy from IBM." (As I have pointed out in the findings, there is nothing im-

C40(d). The final related point which seems to require comment is plaintiffs' contention that if counterclaim components are credited against the antitrust damages, they should be eliminated from the counterclaim. I cannot agree. Plaintiffs are entitled only to their proper antitrust damages. By the court's eliminating elements from the antitrust damage determination which should not have been included in the first place defendant is rendered no less entitled to the damages to which it has been awarded on its counterclaim. Certainly this would be true as to the elements not included in the adjustment, *i.e.*, security, extra manufacturing costs and puntive damages. The additional amounts have not been credited against plaintiffs' antitrust award but rather such award has been fairly fixed in view of them to the best of the court's ability. Assuming that I am right in this view, if Telex collects the present antitrust damage award it will have as much as it is entitled to, even though required to pay or offset the counterclaim. If the counterclaim award should be reversed, an adjustment upward may have to be made in the antitrust award. If the antitrust award does not survive appeal and the trade secret award does, Telex should pay the latter, unless it becomes involved to the contrary in antitrust damage problems surviving appeal.

Change C41 beginning on page numbered 198 to read as follows:

C41. The court accordingly concludes within the perimeter of the proof that Telex and Telex Computer Corporation have sustained damages to their business as a proximate result of de-

proper in itself about copying unpatented products, and indeed that is an important part of competition in the industry.) Thereafter the quantification of counterclaim damage argued and requested by IBM had little or no bearing upon the pervasive effects of trade secret misappropriation now urged, nor any reference to types of counterclaim damage essentially different than those already allowed. The court awarded with some modification in amounts, for reasons stated, trade secret damages precisely on the theory defendant requested them in its proposed findings. It would not be fair to attempt to hold IBM to a waiver of its present broader contentions, but this note may serve to put them in more realistic perspective.

fendant's violations of Section 2 of the Sherman Act in the amount of $86.5 million which amount must be trebled as required by law; and the plaintiffs therefore are entitled to judgment against IBM in the total amount of $259.5 million, plus attorneys' fees of $1.2 million, which the court finds to be reasonable, and for costs in accordance with the stipulation already of record. It is believed and found that any greater amount, although supported by some evidence, would be speculative and not supported by preponderant evidence applying the rule of liberality enjoined by the authorities. Weighing all relevant factors it is believed that any less amount would be contrary to the preponderance of the evidence and accordingly also a miscarriage of justice.

G. *Equitable Antitrust Relief*

C42. Any person, firm, corporation or association shall be entitled to sue for and have injunctive relief against threatened loss or damage by a violation of the antitrust laws in harmony with established principles of equity. 15 U. S. C. § 26. Accordingly, it must be determined what equitable relief, if any, should be granted in favor of the plaintiffs and against the defendant for the protection of plaintiffs' rights in the future and in reasonable enforcement of the antitrust laws in the public interest. *United States v. Grinnell Corporation* [1966 TRADE CASES ¶ 71,789], 384 U. S. 563 (1966), *supra; Reynolds Metals Company v. F. T. C.* [1962 TRADE CASES ¶ 70,471], 309 F. 2d 223 (D. C. Cir. 1962), *supra; United States v. Aluminum Co. of America* [1944-1945 TRADE CASES ¶ 57,342], 148 F. 2d 416 (2d Cir. 1945), *supra; Zenith Radio v. Hazeltine* [1969 TRADE CASES ¶ 72,800], 395 U. S. 100, on remand [1969 TRADE CASES ¶ 72,949], 418 F. 2d 21 (7th Cir. 1969) rev'd on other grounds [1971 TRADE CASES ¶ 73,484], 401 U. S. 321 (1971); *Bedford Cut Stone Co. v. Journeyman Stone Cutters, Inc.*, 274 U. S. 37 (1927); *Swift & Company v. United States*, 196 U. S. 375 (1905); *United States*

v. Oregon State Medical Soc. [1952 TRADE CASES ¶ 67,264], 343 U. S. 326 (1952); *United States v. W. T. Grant Co.* [1953 TRADE CASES ¶ 67,493], 345 U. S. 629 (1953); *Calnetics Corporation v. Volkswagen of America, Inc.* [1973-1 TRADE CASES ¶ 74,356], 353 F. Supp. 1219 (C. D. Cal. 1973). Injunctive relief should not be utilized when not essential for the protection of a litigant's rights or when it would be injurious to the public interest by preventing technological developments or in aid of further anti-competitive conduct, and the courts uniformally have rejected efforts of litigants to use the courts to create or enforce illegal agreements. See *Continental W. P. Co. v. Louis Voight & Sons Co.*, 212 U. S. 227 (1909); *Kelly v. Kosuga* [1959 TRADE CASES ¶ 69,283], 358 U. S. 516, 520 (1959); *Winston Research Corp. v. Minnesota Min. & Mfg. Co.*, 350 F. 2d 134 (9th Cir. 1965); *Kentucky Rural Elec. Coop. Corp. v. Moloney Elec. Co.* [1960 TRADE CASES ¶ 69,804], 282 F. 2d 481, 482 (6th Cir. 1960), cert. denied, 365 U. S. 812 (1961); *Ful-Vue Sales Co. v. American Optical Co.* [1954 TRADE CASES ¶ 67,656], 118 F. Supp. 517 (S. D. N. Y. 1953); *Farbenfabriken Bayer A. G. v. Sterling Drugs, Inc.* [1962 TRADE CASES ¶ 70,424], 307 F. 2d 207 (3d Cir. 1962), cert. denied, 372 U. S. 929 (1963); *United States v. Columbia Artists Management, Inc.*, 1963 CCH TRADE CASES ¶ 70,955 (S. D. N. Y. 1963). Nor should the court unnecessarily involve itself in the task of the administration of prices, product designs and technological applications or other functions neither contemplated under the antitrust laws nor properly performed by the judiciary. See *Booth v. American Telephone and Telegraph Company*, 253 F. 2d 57, 58 (7th Cir. 1958); *Montana-Dakota Utilities Co. v. Northwestern Public Service Co.*, 341 U. S. 246 (1951); *United States v. Pullman Co.* [1944-1945 TRADE CASES ¶ 57,426], 64 F. Supp. 108, 110 (E. D. Pa. 1945), aff'd *per curiam* [1946-1947 TRADE CASES ¶ 57,550], 330 U. S. 806 (1947).

C43. Applying the established principles of these cases to the facts found, and in reasonable relief to the plaintiffs and protection to the public, but without unnecessary interference with technological developments in the industry, the decree herein should contain the following equitable remedies on the plaintiffs' antitrust claims:

(a) IBM should be enjoined for a period of three years from the date of this judgment from entering into or enforcing any contractually specified termination charges or liquidated damages which it otherwise might be entitled to collect because of termination of any long term lease agreement entered into between IBM and any of its end-used customers, with respect to IBM EDP peripheral products that are cable connected to any IBM CPU or its channel.

(b) IBM should be enjoined and required in good faith to make available on request, at the time of first customer shipment of an IBM CPU or its channel, information describing the design of the electronic interface for such product (including the details necessary to describe the characteristics, timing and sequencing of all signals to be interchanged, together with the function of such signals and the expected response to such signals transferred at the interface between such IBM CPU or its channel and the EDP peripheral products cable connected to it) and, in the event that a subsequently shipped IBM EDP peripheral product changes that interface, IBM should be required to make changes in the above information available at the time such product is shipped.*

(c) IBM should be enjoined and required to continue to price separately those System 370 memories which are not a single product with the central processing unit.**

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*The parties and the Court shall use, as an aid in construction of this provision, the IBM Manual GA 22-6794-1: IBM System/360 and System/370 I/O Interface Channel to Control Unit Original Equipment Manufacturers' Information.

**See Findings 110, 111 and Conclusion 31.

(d) IBM should be enjoined and required to price separately its separate EDP products, including but not limited to CPU's, memories (as set forth in paragraph (c)), tape products and their controllers, disk products and their controllers, printer products and their controllers and communication controllers.

(e) Where it offers a separate EDP peripheral product cable connected to an IBM CPU or channel in a separate box and a substantially equivalent version made from substantially common parts integrated into another product, IBM should be enjoined and required to continue to price the integrated version separately from the product into which it is integrated, and should be further enjoined and required to make a good faith effort to set its prices for both such versions with a substantially equivalent profit objectives, and with cost and profit objectives being measured on an equivalent basis.

(f) Neither paragraph (c), (d) nor (e) hereof is intended to require the separate pricing of anything which would not be regarded as a separate product pursuant to Section 3 of the Clayton Act and provided further in this connection that the court does not intend to inhibit technological changes which may alter the definition of what today may be a separate product.

(g) IBM should be enjoined from adopting, implementing or carrying out predatory pricing, leasing or other acts, practices or strategies with intent to obtain or maintain an illegal monopoly in a relevant market for EDP peripheral equipment plug compatible to its CPU's, or any relevant submarkets thereof, in violation of Section 2 of the Sherman Act.

(h) The foregoing injunctions are intended to be effective only within the United States. They and any changes, modifications or amendments thereof should be enforced, construed or considered only upon motion duly made by The Telex Corporation, Telex Computer Products, Inc., or International Business Machines Corporation, or their successors in interest, and such motions should be made on at least twenty days' written notice.

(i) The court should decline to order either the public disclosure by IBM of all planned or anticipated product enhancements, or the divestiture of IBM's holdings, for the reasons more fully developed in the findings.

H. *Telex's Misappropriation of Trade Secrets and Confidential Information—Unfair Competition*

C44. In view of the programmed and massive invasion by Telex of IBM's trade secrets already found, it is not deemed necessary here to analyze the law of trade secrets in general or to discuss fine distinctions and qualifications of which I have been mindful. See e.g., *Motorola, Inc. v. Fairchild Camera & Instr. Corp.*, — F. Supp. — (D. C. Ariz., March 13, 1973); *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U. S. 225 (1964); *Compco Corp. v. Day-Brite Lighting*, 376 U. S. 234 (1964); *Sarkes Tarzian, Inc. v. Audio Devices, Inc.*, 166 F. Supp. 250 (S. D. Cal. 1958), aff'd 283 F. 2d 695, cert. denied, 365 U. S. 869; *A. O. Smith Corporation v. Petroleum Iron Works Co.*, 73 F. 2d 531 (6th Cir. 1934). The facts here go beyond the mere termination of employment and the acceptance of employment from a competitor; disclosures to employers of information acquired during the course of previous employment which was a matter of general knowledge or information as it might be retained in memory; the utilization of skills, expertise and general technical and business information learned in former employment; the employment of "key" employees of a former employer to obtain skills and knowledge in the usual course of business; the obtaining or disclosure of data not confidential or which do not constitute trade secrets reasonably protected by others; information disclosed by the products marketed; the disclosure of information that could not be considered to have been "discovered"; the disclosure of information readily available from other sources; or matters which are generally known in the trade or readily discernible by those skilled in the trade, and such circumstances.

C45. The trade secrets or confidential information found here clearly fall within the definition of formula, patterns, business plans, compilations of information or technical knowledge which were used in IBM's business, which were important in that business, which were treated and sought to be protected as confidential to IBM for the purposes of its business, and which entitled IBM legitimately, by reason of its exceptional diligence, technology and discovery to obtain legitimate competitive advantage over competitors not possessing such knowledge or information and not able, legitimately and within a reasonable time frame, to obtain it otherwise. Telex obtained these trade secrets from IBM by a massive and pervasive program designed to induce the breach of known obligations of IBM employees or former employees. That such information or part of it could have been subsequently procured by Telex, given enough time and expense, by independent investigation, research or experience, did not justify Telex's conduct. That subsequent to the invasion of IBM's trade secrets a portion of the information in the course of marketing of IBM products became available to the public, including Telex, did not excuse Telex's conduct in the first instance nor insulate it from liability to both monetary and equitable relief. See Restatement of Torts § 757; Restatement of Agencies § 395. 21 Okla. Stat. Ann. § 1730 (Supp. 1968); *Bancroft Whitney Co. v. Glen,* 64 Cal. 2d 327, 49 Cal. Rptr. 825, 411 P. 2d 921 (1966); *By-Buk Co. v. Printed Cellophane Tape Co.,* 163 Cal. App. 157, 329 P. 2d 147 (D. Ct. App. 2d Dist. 1958); *Sperry Rand Corporation v. Rothlein,* 241 F. Supp. 549 (D. Conn. 1964); Restatement of Torts, § 396; Restatement of Agency § 312; *Ferroline Corp. v. General Aniline & Film Corp.,* 207 F. 2d 912 (7th Cir. 1953), cert. denied, 347 U. S. 953 (1954); *Atlantic Wool Combing Co. v. Norfolk Mills, Inc.,* 357 F. 2d 866 (1st Cir. 1966); *A. H. Emery Company v. Marcan Products Corporation,* 389 F. 2d 11 (2d Cir.), cert. denied, 393 U. S. 835 (1968); *Hulsenbusch v.*

Davidson Rubber Company, 344 F. 2d 730 (8th Cir. 1965), cert. denied, 382 U. S. 977; *Englehard Industries, Inc. v. Research Instrumental Corp.,* 324 F. 2d 347 (9th Cir. 1963), cert. denied, 377 U. S. 923 (1964); *Midland-Ross Corporation v. Yokana,* 293 F. 2d 411 (3d Cir. 1961); *Schreyer v. Casco Products Corp.,* 190 F. 2d 921 (2d Cir. 1951), cert. denied, 342 U. S. 913 (1952); *Shellmar Products Co. v. Allen-Qualley Co.,* 87 F. 2d 104 (7th Cir.), cert. denied, 301 U. S. 695 (1937); *Standard Brands Inc. v. U. S. Partition & Packaging Corp.,* 199 F. Supp. 161 (E. D. Wisc. 1961); *Sperry Rand Corporation v. A-T-O, Inc.,* 447 F. 2d 1387 (4th Cir. 1971), cert. denied, 405 U. S. 1017 (1972); *Monsanto Chemical Co. v. Miller,* 118 U. S. P. Q. 74 (D. C. Utah 1958); *Dubuque Products Inc. v. Lemco Corporation,* 227 F. Supp. 108 (D. Utah 1963).

C46. On the basis of the facts found from the record, it is concluded that Telex knowingly induced Mr. James to breach his fiduciary obligations to IBM and willfully misappropriated IBM's trade secrets concerning the planning of future products, to IBM's substantial damage.

C47. The court concludes that Telex knowingly and deliberately misappropriated IBM trade secrets in the design of the Aspen products and used those secrets in marketing its 6420/6803 tape products to IBM's substantial damage and in unjust enrichment to Telex. IBM was injured by Telex's misappropriation of the Aspen trade secret in an amount to be reasonably approximated in relationship to IBM's investment in the Aspen research and by the rental revenues which IBM would likely have enjoyed but for the early marketing of Telex's 6420/6803 products.

C48. The court concludes that Telex has knowingly sought, obtained and used confidential trade secret information relating to IBM's Merlin and FRIEND-2 program as a conscious part of a recruitment effort directed to IBM employees possessing or having access to that information. Telex recruited and hired

these IBM employees at least in part for the trade secrets they had or knew. After their employment Telex disregarded the prior agreements between these employees and IBM and used these trade secrets and the proprietary FRIEND-2 program and source code in the development of Telex's Merlin controller, and otherwise, to IBM's substantial damage and Telex's unjust enrichment.

C49. The court further concludes on the basis of the facts found in the record that Telex has engaged in a continuing course of activity calculated to induce the disclosure by IBM employees of IBM confidential information in breach of their fiduciary obligations to IBM so that Telex can misappropriate such information to its own use and benefit. The court here deals not with isolated instances of misappropriation by Telex, nor are we concerned merely with the recruitment by Telex of persons knowledgeable in the design and manufacture of electronic data processing equipment for the primary purpose of developing competitive equipment. We have been confronted here by a widespread, purposeful effort of Telex to secure confidential technical information concerning the design of products which were then unannounced, for the purpose of duplicating such equipment through use of such confidential information. Telex's pattern of recruitment, job assignment, production growth and compensation arrangements, were so designed as to lead inevitably to the misappropriation of IBM's confidential information. Telex's past pattern of conduct makes it apparent that such misappropriation will continue unless the court provides protection commensurate with the threat posed by Telex's deliberate and continuing course of improper behavior with respect to the invasion of IBM's trade secret and confidential information.

C50. The court further concludes that IBM's counterclaim relating to unfair competition and the misappropriation of trade secrets and confidential information is not barred by the statute

of limitations. The parties agree that the court should look to the conflicts law of Oklahoma to determine the applicable statute of limitations, although Telex at one time suggested that it might be appropriate to invoke the substantive law of another state. It is concluded that the Oklahoma statute of limitations law ought to be applied since the counterclaim asserted by IBM arose within the State of Oklahoma. Telex's misappropriation of IBM confidential material was centered in Tulsa. The decisions reached in the course of Telex's practice were made and largely implemented in Tulsa. Almost all the hired IBM engineers were entertained in Tulsa, were offered bonuses in Tulsa, and those that went to Telex signed contracts in Tulsa. The Telex copy of the Aspen products, S6803/6420 tape subsystem, was manufactured in and marketed from Tulsa and the court concludes that these claims arose in the State of Oklahoma. There is no reason to suppose that the result would be different had they arisen within the State of California.

C51. IBM asked the court to conclude that under Oklahoma law the counterclaim is "connected with the subject of the action" within the meaning of Section 273 of Title 12 of Oklahoma Statutes Ann. 1960, and thus cannot be barred unless the complaint is barred, citing *Meyer v. Vance*, 406 P. 2d 996 (Okla. 1965); *Perrault v. Holland*, 360 P. 2d 240 (Okla. 1961); *Gooldy v. J. B. Klein Iron & Foundry Co.*, 170 Okla. 466, 40 P. 2d 1070 (1935); *Guy Harris Buick Co. v. Bryant*, 180 Okla. 117, 233 Pac. 752 (1925). It is true as contended that the primary claims and counterclaims are intertwined to an extent and the trial has disclosed that the evidence to a degree was interrelated. This was among the reasons leading me to deny plaintiffs' motion for severance of the counterclaim. Because this is a federal case, the counterclaim is brought pursuant to Rule 13(a) Fed. R. Civ. P., rather than 12 Okla. Stat. Ann. § 273 (1960). Nevertheless, even though no Oklahoma case closely in point has been found, it

seems likely that the Oklahoma courts, on facts similar to those here, would find the counterclaim permissible under § 273, and therefore subject to the same limitation period as the plaintiff's cause of action. In any event, I am of the opinion that IBM's misappropriation counterclaim is not time barred also because it involves a continuing wrongful course of action pursued to within two years of the filing of the counterclaim—the shortest limitations period contended for by Telex and applicable to tort claims in general. 12 Okla. Stat. Ann. § 95. There is force to the contention of IBM that its counterclaim comes under the Oklahoma three-year statute of limitations because the IBM claim lies in unjust enrichment. The Oklahoma statute provides a three year limitation to causes of action arising out of "express or implied contracts not in writing." 12 Okla. Stat. Ann. § 95 (1960). See *Bidleman v. National Feeders Service*, 268 F. Supp. 904 (W. D. Okla. 1967); *Koehring Company v. National Automatic Tool Co.*, 257 F. Supp. 282 (S. D. Ind. 1966), aff'd *per curiam*, 385 F. 2d 414 (7th Cir. 1967). From another viewpoint, the gist of the claim is the use of the trade secrets, not necessarily their acquisition, and in this sense the statute would not commence to run prior to any such use and, with the period renewed by its continuance. See *Underwater Storage, Inc. v. United States Rubber Co.*, 371 F. 2d 950 (D. C. Cir. 1966), cert. denied, 386 U. S. 911 (1967); *Koehring Co. v. National Automatic Tool Co., supra*. But compare *Monolith Portland Midwest Co. v. Kaiser Aluminum & Chemical Corp.*, 407 F. 2d 288 (9th Cir. 1969); *Shatterproof Glass Corp. v. Guardian Glass Co.*, 322 F. Supp. 854 (E. D. Mich. 1970), aff'd, 462 F. 2d 1115 (6th Cir., cert. denied, 409 U.S. 1039 (1972)). Telex continued to seek and did obtain IBM business planning information after January, 1971. Gruver continued to use IBM trade secrets in the design of the Telex 6803 control unit after January, 1971, and Telex shipped its first unit in November, 1971. After January, 1971, Clemens and his IBM recruits continued to make use of IBM trade secrets

in attempting to construct the Merlin control unit and Telex used these secrets to induce prospective buyers. After January, 1971, Telex continued to use the IBM FRIEND program and sold the FRIEND source deck to CDC. Since January, 1971, Telex has attempted to interest other manufacturers in the then unannounced IBM products named Winchester, Midas, Birch, Apollo and Iceberg.

C52. Moreover, the Oklahoma statute and the cases make it abundantly clear that fraudulent concealment by a wrongdoer of the injured party's cause of action will toll the statute of limitations until the injured party is placed on reasonable notice of the wrong. See 12 Okla. Stat. Ann. § 95(3) (1960); *Morris v. Wise*, 293 P. 2d 547, 55 A. L. R. 2d 1033 (Okla. 1955); *Moses v. Miller*, 202 Okla. 605, 216 P. 2d 979 (1950); *Waugh v. Guthrie Gas, Light, Fuel & Improvement Co.*, 37 Okla. 239, 131 Pac. 174, LRA 1917B 1253 (1913). See also *Murray v. Teape*, 260 P. 2d 727 (Okla. 1953); *Holmes v. McKay*, 383 P. 2d 655 (Okla. 1962). No evidence has been called to my attention to suggest that IBM learned, or should have learned, of the misappropriation more than two years prior to the filing of its counterclaim, and the preponderance of the evidence indicates that up to two years prior to that filing IBM was justified in assuming that there was no utilization of its trade secrets of the nature here found. In addition, IBM's discovery of the misappropriation was no doubt delayed by Telex's attempted concealment of the facts from IBM. IBM was led by Telex and the ex-IBM engineers to believe that these employees were honoring their obligations to IBM and refraining from utilizing IBM confidential information and that Telex had ceased recruiting IBM engineers. Up to the very time of the trial Telex and various of its employees formerly working for IBM have insisted that no confidential information was used; and only upon full inquiry at the trial did it appear clear that such protestations could not be accepted. Absent such searching

inquiry in open court and the discovery made by IBM following the filing of the complaint by Telex, it seems possible that IBM could yet be ignorant of the extent, or even the existence, of the actionable misappropriation. Under all these circumstances the court rules that IBM's said counterclaim is not barred by any statute of limitations. See *Wills v. Black and West*, 344 P. 2d 581 (Okla. 1959); *Kansas City Life Ins. Co. v. Nipper*, 174 Okla. 634, 51 P. 2d 741 (1935); *McClenahan v. Oklahoma R. Co.*, 131 Okla. 73, 267 Pac. 657 (1928); *Waugh v. Guthrie Gas, Light, Fuel and Improvement Co.*, 37 Okla. 239, 131 Pac. 174, LRA 1917 B 1253. Cf. *Public Service Co. of New Mexico v. General Electric Co.*, 315 F. 2d 306 (10th Cir.), cert. denied, 374 U.S. 809 (1963).

I. *Conclusions Concerning Infringement of Copyright Material*

C53. IBM claims that its copyrights in six copyrighted publications have been infringed in one or more of a total of twelve Telex manuals or publications. The IBM publications relate to and are marketed for the use of IBM customers and IBM maintenance personnel in connection with several different IBM products. A valid certificate of copyright was issued by the Registrar of Copyrights in respect of each of the publications involved and each is therefore entitled to *prima facie* presumption of authorship, originality, copyrightability and compliance with statutory copyright formalities. *Tennessee Fabricating Co. v. Moultrie Mfg. Co.*, 421 F. 2d 279 (5th Cir.), cert. denied, 398 U. S. 928 (1970); *Flick-Reedy Corp. v. Hydro-Line Mfg. Co.*, 351 F. 2d 546 (7th Cir.), cert. denied, 383 U. S. 958 (1970); *Drop Dead Co. v. S. C. Johnson & Son, Inc.*, 326 F. 2d 87 (9th Cir. 1963), cert. denied, 377 U. S. 907 (1964); *Harcourt, Brace and World, Inc. v. Graphic Controls Corp.*, 329 F. Supp. 517 (S. D. N. Y. 1971). Telex has offered no evidence to overcome this presumption. Telex admits that it is guilty of the infringement alleged in Count 1. Each of

the Telex publications complained of in the remaining counts of the counterclaim likewise contain portions identical or virtually identical to portions of the other five IBM manuals. Telex has offered no explanation for these substantial identities. The similarities are such that this court would be hard pressed to find any reasonable explanation other than deliberate copying. Telex asserts by way of defense that simple directions dictated by functional considerations, even if original, do not contain sufficient intellectual labor to constitute writing, and that apart from the particular tangible form and manner of their composition or presentation, ideas, methods and systems are not proper subjects of copyright and are not protected from appropriation by others. I do not question these general propositions but the authorities cited by plaintiffs to sustain them readily demonstrate that they are not in point. *E. H. Tate Co. v. Jiffy Enterprises, Inc.*, 16 F. R. D. 571 (E. D. Pa. 1954) for example involved small sketches by the alleged infringer and a legend "apply to wall". Two of the cited authorities, *Guthrie v. Curlett*, 36 F. 2d 694 (2d Cir. 1929), and *Gordon v. Weir*, 111 F. Supp. 117 (E. D. Mich. 1953), seem to fully support defendant's position. *Eisenschiml v. Fawcett Publications*, 246 F. 2d 598 (7th Cir. 1957), and *Morrissey v. Procter & Gamble Co.*, 379 F. 2d 675 (1st Cir. 1967), appear more nearly in point and teach respectively that *de minimis* copying and availability of only limited number of forms of expression in giving directions for a box top contest may justify a decision of non-infringement. *Crume v. Pacific Mut. Life Ins. Co.*, 140 F. 2d 182 (7th Cir. 1944), which on the surface may appear in point to a degree, clearly draws the distinction when it notes: "The description of the art in a book, though entitled to a benefit of copyright, lays no foundation for an exclusive claim to the art itself. The object of the one is explanation; the object of the other is use. The former may be secured by copyright. The latter can only be secured, if it can be secured at all, by letters patent."

C54. Certain Telex manuals relate to the Itel/ISS-made 5314 disk drive subsystem and on their face purport to be Itel/ISS publications. Assuming that the actual copying was performed by Itel/ISS, that fact does not immunize Telex against the claim of infringement under the circumstances of this case. These manuals are used to facilitate maintenance, preventive maintenance and operation of the Telex 5314; Telex has the exclusive marketing rights for the 5314 and provides service as part of its marketing of that device. Telex's interest and participation in the distribution of these manuals is such that Telex is clearly a related or contributory infringer and jointly and severally liable with Itel/ISS for the copying of the IBM manuals. *Buck v. Jewell-LaSalle Realty Co.*, 283 U. S. 191 (1931); *Shapiro, Bernstein & Co. v. H. L. Green Co.*, 316 F. 2d 304 (2d Cir. 1963); *Bradbury v. Columbia Broadcasting System, Inc.*, 287 F. 2d 478 (9th Cir.), cert. dismissed, 368 U. S. 801 (1971); *Screen Gems-Columbia Music Inc. v. Mark-Fi Records, Inc.*, 327 F. Supp. 788 (S. D. N. Y. 1971), rev'd on other grounds, 453 F. 2d 552 (2d Cir. 1971); *Davis v. E. I. Du Pont De Nemours*, 240 F. Supp. 612 (S. D. N. Y. 1965).

C55. The fact that some pages of infringing Telex manuals do not contain infringing material copied from an IBM manual does not exonerate Telex for the portion which is infringed, for the presence of original elements in the copied matter does not relieve the infringer of liability if the infringed material is substantial. *Davis v. E. I. Du Pont De Nemours, supra.* The exact proportion of the copied material to the total volume of the work is immaterial, and it is sufficient if a material and substantial part shall have been copied even though it be a small part of the whole. See *Henry Holt & Co. v. Liggett & Myers Tobacco Co.*, 23 F. Supp. 302 (E. D. Pa. 1938).

C56. The doctrine of "fair use" clearly is inapplicable to the facts of this case. That doctrine permits limited use of material protected by statutory copyright, such as in book reviews, newspapers or scientific journals, in order more fully to promote the ultimate goals of copyright laws. Telex's use of the materials copied from IBM materials evidences only a purpose to appropriate IBM's creative efforts for Telex's own profit, precluding application of the "fair use" doctrine. *Tennessee Fabricating Co. v. Moultrie Mfg. Co.*, 421 F. 2d 279 (5th Cir.), cert. denied, 398 U. S. 928 (1970), *supra.*

C57. The court concludes that each of the twelve Telex manuals constitutes an infringement of IBM's copyright in one or more IBM manuals. As a result of Telex's infringement, IBM is entitled to an injunction against continuing infringement. 17 U. S. C. § 101(b) (1947). IBM is also entitled to statutory damages under the Copyright Act, 17 U. S. C. § 101(b), in the amount of $250 for each infringement and $1 for each additional infringing copy. Since two of the Telex manuals each infringed two IBM manuals, publication of the twelve manuals constitutes fourteen separate infringements of the six IBM manuals. *L. A. Westermann Co. v. Dispatch Printing Co.*, 249 U. S. 100 (1919); *Bacarro v. Pisa*, 252 F. Supp. 900 (S. D. N. Y. 1966); *Harry Alter Co. v. A. E. Borden Co.*, 121 F. Supp. 941 (D. Mass. 1954). The Telex manuals are utilized and distributed by Telex in connection with the marketing of the various Telex devices to which they relate. Calculation of the statutory damages on the basis of the number of units shipped of each device relating to each infringement by each Telex manual results in a total of $13,776. In addition IBM is entitled to the destruction of all copies of the infringing Telex manuals insofar as still under the control of Telex, 17 U. S. C. § 101(d), and reasonable costs and attorneys' fees. 17 U. S. C. § 116.

J. *Remedial Provisions Under Counterclaim*

C58. Accordingly, the court concludes that IBM is entitled to an injunction ordering Telex:

a. To return to IBM all IBM documents and all Telex documents containing IBM confidential information which are in

Telex's custody or under its control, and to destroy all copies of Telex manuals under its control or in its custody which infringe IBM copyrighted manuals.

b. To refrain from hiring or soliciting any IBM employee for a period of two years without approval from the court.

c. To refrain from copying any IBM copyrighted materials.

d. To refrain from soliciting or using any IBM confidential or proprietary information.

e. To refrain from assigning any former IBM employee employed now or in the future by Telex to the development or manufacture of products functionally equivalent or similar to those on which such employee worked at IBM for a period of not less than two years following the termination of his employment with IBM.

C59. The court further concludes that IBM is entitled to damages in the following amounts on its counterclaims:

a. Statutory damages for copyright violation in the amount of $13,776, together with attorneys' fees in the sum of $3,000, which the court finds to be reasonable.

Except as hereinabove provided and as reflected and provided in the amended judgment and decree filed herewith, all motions to correct, amend or alter the conclusions of law and judgment and decree or for a new trial as hereinbefore filed are hereby denied.

b. $4.5 million for losses through December of 1972 in monthly rentals of 3803 and 3420 units as a result of the accelerated shipments of Telex 6803 and 6420 replacement units which were made possible by the misappropriation of IBM's trade secrets.

c. $13 million in damages, as in the findings more particularly indicated, measured by the additional advantages secured by Telex in the development of its Aspen and Merlin type products through misappropriation of the defendant's trade secrets.

d. $3 million for the costs of increased security in 1971 and 1972.

e. $400,000 for the additional cost of manufacturing the IBM Merlin head arm within IBM.

C60. In light of the willful, deliberate and pervasive nature of Telex's unlawful conduct, the court further concludes that IBM is entitled to punitive damages in the amount of $1 million.

K. *Conclusion*

C61. In sum, under the facts and the law of the case it has been concluded that plaintiffs' complaint has required vindication in the manner provided above in justice to them and in aid of proper competition; that defendant's counterclaims similarly have required vindication in justice to it and in discouragement of improper competition.

Dated this 9th day of November, 1973.

A. SHERMAN CHRISTENSEN
Senior United States District Judge
(Assigned)

Appendix B

IN THE
United States District Court
FOR THE NORTHERN DISTRICT OF OKLAHOMA
No. 72-C-18
No. 72-C-89
(Consolidated)

THE TELEX CORPORATION
AND TELEX COMPUTER PRODUCTS, INC.
Plaintiffs,

vs.

INTERNATIONAL BUSINESS MACHINES CORPORATION,
Defendant.

AMENDED JUDGMENT AND DECREE

The issues having been duly tried to the court, findings of fact, conclusions of law and judgment and decree having been filed and entered on September 17, 1973, timely motions to amend such findings of fact, conclusions of law and judgment and decree having been filed, argued and considered by the court, and the court having made certain amendments and supplements to its findings of fact and conclusions of law; now, accordingly,

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

1. That plaintiffs, The Telex Corporation and Telex Computer Products, Inc., have and recover judgment of and from the defendant International Business Machines Corporation in the sum of $259.5 million, after the found actual damages have been trebled as required by law, together with attorneys' fees in the sum of $1.2 million, and stipulated costs of court in accordance with the agreement of the parties heretofore entered on the record.

2. IBM is hereby enjoined for a period of three years from the date of this judgment from entering into or enforcing any contractually specified termination charges or liquidated damages which it otherwise might be entitled to collect because of termination of any long term lease agreement entered into between IBM and any of its end-user customers, with respect to IBM EDP peripheral products that are cable connected to any IBM CPU or its channel.

3. IBM is enjoined and required in good faith to make available on request, at the time of first customer shipment of an IBM CPU or its channel, information describing the design of the electronic interface for such product (including the details necessary to describe the characteristics, timing and sequencing of all signals to be interchanged, together with the function of such signals and the expected response to such signals transferred at the interface between such IBM CPU or its channel and the EDP peripheral products cable connected to it) and, in the event that a subsequently shipped IBM EDP peripheral product changes that interface, IBM shall make changes in the above information available at the time such product is shipped.*

4. IBM is enjoined and required to continue to price separately those System 370 memories which are not a single product with the central processing unit.**

5. IBM is enjoined and required to price separately its separate EDP products, including but not limited to CPU's, memories (as set forth in paragraph 4), tape products and their controllers, disk products and their controllers, printer products and their controllers, and communication controllers.

6. Where it offers a separate EDP peripheral product cable connected to an IBM CPU or channel in a separate box and a substantially equivalent version made from substantially common

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*The parties and the Court shall use, as an aid in construction of this provision, the IBM Manual GA 22-6794-1; IBM System/360 and System/370 I/O Interface Channel to Control Unit Original Equipment Manufacturers' Information.

***See* Findings 110, 111 and Conclusion 31.

parts integrated into another product, IBM is enjoined and required to continue to price the integrated version separately from the product into which it is integrated, and is further enjoined and required to make a good faith effort to set its prices for both such versions with a substantially equivalent profit objective, and with cost and profit objectives being measured on an equivalent basis.

7. Neither paragraph 4, 5, nor 6 hereof is intended to require the separate pricing of anything which would not be regarded as a separate product pursuant to Section 3 of the Clayton Act and provided further in this connection that the court does not intend to inhibit technological changes which may alter the definition of what today may be a separate product.

8. IBM is enjoined from adopting, implementing or carrying out predatory pricing, leasing or other acts, practices or strategies with intent to obtain or maintain an illegal monopoly in a relevant market for EDP peripheral equipment plug compatible to its CPU's, or any relevant submarkets thereof, in violation of Section 2 of the Sherman Act.

9. The foregoing injunctions are intended to be effective only within the United States. They and any changes, modifications or amendments thereof may be enforced, construed or considered only upon motion duly made by The Telex Corporation, Telex Computer Products, Inc., or International Business Machines Corporation, or their successors in interest, and such motions shall be made on at least twenty days' written notice.

10. International Business Machines Corporation shall have and recover from Telex Corporation and Telex Computer Products, Inc., the total sum of $21,913,776, made up as by the conclusions of law shown, together with attorneys' fees for the adjudged copyright infringement in the sum of $3,000, and costs in accordance with the stipulation heretofore made of record.

11. The Telex Corporation and Telex Computer Products, Inc., are enjoined and required:

a. To return to IBM all IBM documents and all Telex documents containing IBM confidential information which are in Telex's custody or under its control, and to destroy all copies of Telex manuals under its control or in its custody which infringe IBM copyrighted manuals.

b. To refrain from hiring or soliciting any IBM employee for a period of two years without approval from the court.

c. To refrain from copying any IBM copyrighted materials.

d. To refrain from soliciting or using any IBM confidential or proprietary information.

e. To refrain from assigning any former IBM employee employed now or in the future by Telex to the development or manufacturer of products functionally equivalent or similar to those on which such employee worked at IBM for a period of not less than two years following the termination of his employment with IBM.

12. Notwithstanding the undetermined claims relating to foreign markets, the court, pursuant to Rule 54(b) Fed. R. Civ. P., hereby determines that there is no just cause for delay in the entry of this judgment, and the Clerk is hereby directed to enter final judgment in accordance with the foregoing, subject to immediate appeal. A stay of execution is hereby granted subject to disposition of defendant's motion of September 26, 1973, pursuant to Rule 62(d) of the Federal Rules of Civil Procedure for an order suspending injunctive relief against defendant pending appeal or, in the alternative, for an order requiring plaintiffs to provide security in the account deemed appropriate by the court, and subject to the disposition of other motions, if any, for stay or supersedeas in connection with an appeal of this judgment by any party.

13. Against the possibility that it should be determined that reserved claims with reference to foreign markets are not suffi-

ciently separate as to permit the invocation of Rule 54(b), Fed. R. Civ. P., and that despite the provisions of 28 U. S. C. § 1292 (a)(1) with reference to appeal of interlocutory injuctions, the antitrust and trade secret damage awards herein otherwise would not be subject to immediate appeal, the court hereby finds and states:

That it is its opinion that all of the provisions of the foregoing orders and judgment, including the question of antitrust and trade secret damages, as well as the injunctions, involve controlling question of law as to which there is substantial ground for differences of opinion, and that an immediate appeal from said orders and the foregoing judgment as a whole, and each part thereof, may materially advance the ultimate determination of this litigation; that the reserved claim as to foreign markets likely will involve questions concerning damages as well as injunctions the same as, or similar to, those which would be decided in an appellate review of the foregoing judgment, and that unless and until all such questions are decided on appeal from this judgment there likely would be great extra expense and the expenditure of extended time and effort in discovery concerning, and adjudication of, the foreign market claim much of which may be rendered either more certain and expeditious, or needless, if the foregoing judgment is reviewed in its entirety.

Dated this 9th day of November, 1973.

A. Sherman Christensen
Senior United States District Judge
(Assigned)

Appendix C

United States Court of Appeals

Tenth Circuit

Nos. 73-1874, 73-1875, 73-1876, 73-1877, 73-1878, 73-1961 and 73-1962.

Appeal From The United States District Court
For The Northern District of Oklahoma
(D.C. # # 72-C-18, 72-C-89)

The Telex Corporation, and Telex Computer Products, Inc.,
Plaintiffs-Appellees-Appellants (and Appellants on Counterclaim),

v.

International Business Machines Corporation,
Defendant-Appellant-Appellee (and Cross-Appellant on Counterclaim).

OPINION

Thomas D. Barr, New York, New York, and Nicholas DeB. Katzenbach, Armonk, New York (Frederick A. O. Schwarz, Jr., Robert F. Mullen, and George Vradenburg III, New York, New York; Truman B. Rucker, of Rucker, Tabor, McBride & Hopkins, Tulsa, Oklahoma; Robert H. Harry, of Davis, Graham & Stubbs, Denver, Colorado; and Cravath, Swaine & Moore, New York, New York, of Counsel, with them on the Brief), for Appellant, International Business Machines Corporation.

Floyd L. Walker, of Walker, Jackman & Associates, Inc., Tulsa, Oklahoma, and Richard B. McDermott, of Boesche, McDermott & Eskridge, Tulsa, Oklahoma (Serge Novovich, Tulsa, Oklahoma, with them on the Brief), for Appellees, The Telex Corporation, and Telex Computer Products, Inc.

Before SETH, McWILLIAMS and DOYLE, Circuit Judges.

PER CURIAM.

I.

COMPLAINT AND DISCOVERY PROCEEDINGS.

The appellant, International Business Machines Corporation (IBM), here appeals a judgment in favor of Telex Computer Products, Inc. (Telex), appellee, in the total amount of $259.5 million, plus $1.2 million in attorneys' fees and costs (this latter amount was stipulated by the parties). Actual damages were determined to be in the amount of $117.5 million. This amount was reduced substantially before trebling so as to prevent Telex from profiting as a result of certain advantages obtained from unlawful competitive activities and its illegal obtaining of trade secrets of IBM. Originally the trial court had ordered damages in favor of Telex in the amount of $352.5 million, but in amended findings and judgment this was reduced as stated above.

Telex has alleged in the complaint that IBM violated sections 1 and 2 of the Sherman Act, 15 U.S.C. §§ 1, 2, and section 2 of the Clayton Act, 15 U.S.C. § 13, in that IBM had monopolized and attempted to monopolize the manufacture, distribution, sale, and leasing of electronic data processing equipment. The complaint was later amended to charge IBM in more specific terms with monopolization in the manufacture, distribution, sale, and leasing of plug compatible peripheral products which are attached to IBM central processing units.

IBM in turn filed a counterclaim against Telex in which the latter is charged with unfair competition, theft of trade secrets, and copyright infringement pursuant to both state law and 17 U.S.C. § 101.

It is alleged that jurisdiction is based upon 15 U.S.C. § 15, which makes provision for a private claim for injuries resulting

from violation of federal antitrust laws. IBM's counterclaim, sounding in unfair competition, and copyright infringement, is allegedly brought pursuant to 28 U.S.C. § 1332 (diversity of citizenship) and § 1338.

Following the filing of the case, it was transferred to the United States District Court for the District of Minnesota. This was for pretrial proceedings together with other cases against IBM which were then pending.

A supplemental complaint was filed by Telex. This charged that IBM had violated section 2 of the Sherman Act by announcing its "Fixed Term Plan" and "Extended Term Plan" for the leasing of IBM equipment.

Still other supplemental claims were filed by Telex alleging other violations and seeking an injunction to prohibit IBM from integrating memory and disk control circuitry as well as from lowering its prices on memories.

The court in Minnesota issued a temporary restraining order enjoining IBM from announcing its new central processing units. However, this order was dissolved by the Court of Appeals for the Eighth Circuit. Following the completion of discovery, the instant case was remanded to the United States District Court for the Northern District of Oklahoma for trial.

Further pretrial conferences were held in the District Court during February, March, and April 1973, and following waiver of a jury the cause went to trial to the court on April 16, 1973. The trial was for twenty-nine days. The District Court on September 17, 1973, issued very extensive findings of fact and conclusions of law in which it, as has been noted, entered judgment in favor of Telex against IBM. The trial court amended its findings of fact and conclusions of law and entered a reduced judgment on November 9, 1973.

II.

EVIDENCE PRESENTED AT THE TRIAL

The evidence established that IBM was first incorporated in 1924 and operated as a producer of office machinery and equipment. However, in the early 1950's it entered the electronic data processing industry. It produced a research computer in 1953 and installed its first computer for use in commercial work in 1955. Telex began manufacturing electronic data processing products in the year 1959. The evidence established in the court found that the electronic data processing industry was a young, dynamic one with a tremendous amount of revenue. In 1952 its total revenues were $48 million. By 1970 its total revenues equalled $10.2 billion. The number of companies in the electronic data processing business grew from thirteen in 1952 to 1,773 in 1970. Nevertheless, IBM, although originally dominant, steadily declined. It had 64.1 per cent of the electronic data processing revenues in 1952, but only 35.1 per cent of the total revenue in the year 1970. Although IBM was recognized as an industry leader, having more revenue from the industry than any other company, it did not, according to the finding of the trial court, have monopoly power or status in the industry as a whole.[1]

At the outset it is necessary to distinguish between the general systems portion of the industry which encompasses the manufacture of the basic electronic data processing system, the essential equipment being a central processing unit. The number of manufacturers engaged in the manufacturing of the processing units increased dramatically, from three in 1952 to ninety-six in 1972. The court found that about eight or nine of these were considered principal manufacturers. In the segment of the industry

1. By way of comparison, Telex's share of the total EDP industry has been considerably smaller than IBM's, although its growth has been rapid. Telex reported EDP revenues of $870,000 in fiscal 1967, increasing to almost $57 million in fiscal 1971.

involving the manufacture of the central processing units, IBM did not have monopoly power, although it was estimated by the court that its market share was about thirty-five per cent.

In addition to the central processing unit, a data processing system also has a number of so-called peripheral devices which are connected with the central processing unit and which perform various special functions in the data processing system. These include information storage components like magnetic tape drives, magnetic disk drives, magnetic drums and magnetic strip files; terminal devices such as printers; memory units, which are specialized storage units, and other similar types of peripheral components. Sometimes these devices are included in the central processing unit, that is, do not exist as external components. It is these peripheral components with which we are primarily concerned in this lawsuit. The importance of these can be judged from the fact that the court found that they constitute 50 to 75 per cent of the total price of an electronic data processing system. The term "plug compatible peripheral device" is the specific class of equipment that enters into this case. What is meant is that a producer of a complete electronic processing unit manufactures, as noted, the central processing unit and peripheral components which are geared to use on that central processing unit. Many manufacturers produce peripheral components primarily for attachment to central processing units of a particular manufacturer and so, therefore, the plug compatible peripheral device refers to a component which is functionally equivalent to the manufacturer's peripheral device and can be readily plugged into that central processing unit. Undoubtedly it is the wide use of the IBM central processing unit that caused Telex and others to market peripheral devices which were plug compatible with the IBM unit and which could replace IBM peripheral devices which had been made for the IBM central system.

The Relevant Market:

The District Court found that there existed a definable market for all peripheral devices plug compatible with IBM processing units. The court further found that there were individual submarkets for each particular type of peripheral product.

In making its finding as to the scope and extent of the plug compatible peripheral, the trial court used IBM documents which found that the original entry into the market was relatively simple and easy because the manufacturer needed only to produce the peripheral device and he could copy tested IBM peripheral products. The number of manufacturers of IBM peripherals arose from two or three in 1966 to approximately 100 as of the time of trial. Telex and some eleven others were the major manufacturers of IBM plug compatible products.

Originally, of course, IBM, being the only manufacturer of peripheral products plug compatible with its system, had 100 per cent of the market. The court found that as other manufacturers entered the plug compatible market with IBM, the IBM share became substantially eroded and this is particularly true starting in 1968, at which time market erosion occurred first in the tape drive line followed by the disk drive line in 1969 and with continued erosion into 1970.[2]

2. The court made findings as to the market share of IBM in the plug compatible peripheral market as follows:

In Finding 66, Finding 67 and Finding 68, the District Court enunciates the statistics which it feels are relevant to a consideration of IBM's status in this "plug compatible peripheral market." IBM's revenues in 1970 for its plug compatible peripheral products equalled $1,137,819,000—slightly less than one-third of its total 1970 revenues for all electronic data processing products. In that same year, all other manufacturers of IBM plug compatible peripheral products received slightly less than $100 million in revenues. With regard to revenues from specific types of peripheral products in 1970, IBM was said to have 90% of revenues from tape units attached to IBM CPU's with plug compatible competitors having 10%; IBM had 68% of revenues from disk drive units, with competitors having 32%; IBM had 99.6% of all revenues for memory products attached to IBM CPU's, with competitors having the remaining 0.4%; IBM had 92.3% of revenues from communications controllers attached to IBM CPU's, with competitors having the remaining 7.7%.

Based on the above and other figures, qualified by certain other factors which the District Court felt appropriate, the court made a specific finding that IBM's share of the relevant submarkets or the combined submarkets comprehended in the general market classification "peripheral equipment plug compatible to IBM" was such as to permit and support an inference of monopoly power on the part of IBM.

The court considered the erosion of IBM's market in this area as appropriate background for consideration of the IBM antitrust violations which the court concluded had occurred. The primary determination was that IBM was guilty of monopolization or attempting to monopolize, contrary to section 2 of the Sherman Act in five specific respects:

1. Announcement and institution of the 2319A disk storage facility in September 1970.

2. The announcement of the 2319B disk storage facility in December 1970.

3. The announcement of the Fixed Term Plan long term leasing program in May 1971.

4. The announcement and implementation of the Extended Term Plan, which was also a leasing plan, in March 1972.

5. IBM's pricing policies with regard to its memory products during 1970 and 1971.

The Above-Mentioned 2319A and 2319B Programs:

These took place following the erosion of the IBM share of the plug compatible peripheral market. Management became even more concerned when in January 1970 the United States Bureau of the Budget notified the federal agencies that they should consider the possibility of using the less expensive non-IBM plug compatible peripheral devices with the IBM central processing unit. IBM's management committee thereafter designated peripherals as a key corporate strategic issue which was their way of

designating the problem as a key and important one. A Peripheral Task Force, headed by H. E. Cooley, Vice President of IBM's Systems Development Division, was created in March 1970. The purpose of this was to examine the competitive threat to IBM of plug compatible suppliers. Judge Christensen found that one of the purposes of this was to study and recommend plans and product strategies to impede the growth of IBM's plug compatible competition and further found that the task force made in-depth analyses of various plans and product strategies, each having as a significant purpose containment and retardation of the growth of IBM plug compatible competitors.[3]

In response to the market erosion problem, IBM first produced the Mallard Project announced on September 23, 1970, as IBM's 2319A disk storage facility for the 145 system 370 computer. The court apparently construed this effort as the launching of a so-called fighting ship even though IBM considered it a competitive effort responsive to competitors' inroads. The court looked at it, however, as being specifically designed to contain plug compatible

3. A cursory analysis of many of the exhibits relative to the work of the Cooley Task Force leaves one with some doubts as to whether the findings of the court are established. These exhibits do reflect that the task force was concentrating on the subject of plug compatible peripherals, that they were interested in determining IBM's "exposure areas," and that they wanted to develop an "optimum strategy." The exhibits also indicate that the competitive areas were being studied on a product-by-product basis. But the exhibits also indicate that the task force was concerned with better economies and price performance, accelerated technological development, and shielding products through subsystem design as a way of maintaining IBM's market share. The task force did evidence an interest in knowing about IBM competitors' economic "viability, or lack thereof," in particular about Telex and Memorex.

Briefing charts used by the task force in its report to the Management Committee on July 31 indicated that *price* was the big reason why IBM was losing customers in the plug compatible market. The Management Committee was also given forecasts of what would happen to IBM's share of the plug compatible peripheral market by 1976 if the trend of erosion continued. Whatever decisions were reached in the Management Committee meeting, Cooley concluded in an August 3 memo that future action in the peripherals area would be "product strategy oriented."

disk competition and to maintain control of the plug compatible disk market for IBM. It was characterized as unlawful, predatory conduct.

The product which IBM had before the 2319A was the 2314 disk drive, but its competitors had developed a 2314-equivalent disk drive, plug compatible with IBM's central processing unit. They were marketing it at a substantially cheaper rate than an IBM 2314.

The IBM 2314 disk drive was produced in three basic configurations or "boxes"; the 2312, a box containing one 2314 disk drive; the 2318, a box containing two disk drive spindles; and the 2313, a box containing four disk drive spindles. The 2319A was basically a 2313 box with one 2314 spindle removed, leaving a three-spindle box. Unlike the 2312, 2313, or 2318, or the competitors' plug compatible equivalents, the 2319A could only be connected to the IBM System 370 CPU through an integrated file adapter (IFA) built into the CPU itself, rather than through the formerly used external disk control unit. Except for this difference in the way it was connected to the CPU (at that time not duplicated by IBM's competitors), the 2319A was the functional equivalent of three 2314 disk drive spindles; that is, a 2312 box and a 2318 box.

The 2319A using the integrated file adaptor was priced substantially below either the IBM three-spindle configuration having the external disk controller on the non-IBM plug compatible three-spindle unit. The total rental for the 2319A was $1,550 as compared with a monthly charge of $1,420 for the old external control unit plus $1,455 for three 2314 spindles, a total of $2,875. Not only did this furnish an incentive for use of the 2319A rather than the older IBM disk configurations, it furnished an incentive for utilization of the 2319A rather than the competitors' plug compatible equivalents to the 2314, since it was priced below the price then being offered by IBM's plug compatible competitors,

including being $100 per month per spindle below Telex's current price for equivalent disk drives. However, the 2319A price was not below production costs and IBM anticipated profit on the item to be in excess of 20 per cent.[4]

Following the announcement of the 2319A program in September 1970, a second peripheral task force was organized in October 1970 to further analyze competitors in the plug compatible disk drive area. The analysis included Telex which was determined to be a viable and aggressive competitor, although its manufacturing costs were 10 to 15 per cent above IBM's. It is to be gleaned from the trial court's Finding 80 that Telex's greatest problem was the impact of IBM which thereby shortened product life. The task force determined that Telex and Memorex were IBM's biggest competitors in the plug compatible disk drive area. It studied likely impact on these two companies of various possible price cuts, forecasting the price reactions which Telex and Memorex could be expected to make and the impact of such price cuts on the profits and revenues of Telex and Memorex.

On December 14, 1970, the 2319B merchandising program was announced. This enabled price cuts which were not possible with the 2319A to be extended to a larger body of users having the IBM system 360 computer. The 2319B was a box containing three 2314 disk drives, utilizing an external disk controller designed for 2314 units being attached to the CPU rather than using the internal IFA controller to which the 2319A had to be attached.

4. IBM argued that the 2319A was a competitive response to market conditions. They also justified the project on the ground that it enabled them to reuse 2314 disk units which were being turned back into IBM by customers who were switching to competitors' plug peripheral products. While the court considered this argument, it considered it of minor importance as a motive for IBM's price cut. Instead, it considered the 2319A a price cut not justified on the basis of reduced manufacturing costs, designed to have the maximum impact on IBM's plug compatible competitors. It considered the price cut designed to contain and suppress IBM's plug compatible disk competition, and intended to unlawfully maintain IBM's monopoly share of the disk drive market.

Here again the prices were reduced in a very substantial amount, an amount which was below any of its plug compatible disk competitors. Although this price cut was not below cost, the court found that it did not represent any technological advance over former 2314 configurations, and it also found that it was a predatory action which was designed to maintain for IBM a 94 per cent share of the plug compatible disk drive market which it controlled at the time of the announcement.[5]

In December 1970, according to the finding of the court (undoubtedly this is supported by the evidence), IBM eliminated its "additional use" charges on all disk drive devices (Numbers 2314, 2319 and 3330). This amounted to a further price reduction on IBM disk drives.

The court found that the 2319A and B programs affected the profits of IBM's competitors, but they nevertheless were able to respond. They made price cuts and adopted marketing techniques which resulted in continuing erosion of IBM's market share. Telex's volume increased substantially from November 1970 to December 31, 1972. Indeed, IBM maintains that Telex actually increased its profits over a forecast of some $14 million.

Thus, the court's characterization of IBM's 2319A and B programs as being predatory was based on the court's view of the intent with which these were carried out rather than on the actual results which were achieved.

The Long-Term Leasing Plans:

The trial court also concluded that IBM's Fixed Term Leasing Plan together with its Extended Term Leasing Plan announced in May 1971 and March 1972, respectively, also constituted predatory conduct violative of the antitrust laws. However, IBM maintains that its leasing plans were lawful competitive responses to

5. The court did acknowledge that the price cut was not below cost or below a reasonable expectation of profit for IBM. (Finding IIIa).

the leasing plans which were then being offered by most of its competitors.

Although the trial court characterized the leasing plans as being predatory, at the same time it recognized that IBM was facing the loss of considerable systems and peripheral business and that some such plan was necessary. The court also recognized that these leasing plans were not per se invalid; that they might in a different context have been justified. But the court in Finding 88 expressed the viewpoint that these long-term leasing plans were invalid in the light of IBM's dominant market position in the plug compatible business.

The IBM Fixed Term Plan provided a 15 per cent reduction in purchase price plus one and two year leases on certain IBM disks, tapes, and printers, with an 8 per cent monthly rental discount for one year leases and a 16 per cent discount for two year leases. It provided stringent penalties in the event of termination. The termination of a two year lease during the first twelve months brought about a penalty of five times the month rental charge; the termination of a one year lease or of a two year lease during the second year caused a penalty of two and one-half times the monthly rental charge. Neverthless, the Fixed Term Plan reduced IBM's prices substantially. However, Telex's prices were actually lower than those of IBM because Telex often bargained concessions which reduced the prices below their lists.

IBM's Fixed Term Plan leases involved plug compatible peripheral products competing with plug compatible product equivalents.

The chief executive officer of IBM, Mr. Carey, testified that the peripherals were subject to the fixed term plan because of the necessity for either reducing prices or going out of business "and so they were logical candidates . . ." But in June 1971, IBM's competitors controlled only 14.5 per cent of the disk market and 13.7 per cent of the tape market plug compatible with IBM's central processing units.

One of the contentions of Telex (argued in its brief) is that all of the tapes, disk drives, printers, and controllers included in the Fixed Term Plan were those which were subjected to plug compatible competition. Those items which were not subjected to plug compatible manufacturer competition were not included in the Fixed Term Lease program. Thus, Telex concludes that it was a strategy which was designed to destroy the competition.

Events Preceding or Leading Up to the Long-Term Leasing Plan:

IBM's 2319B program which was announced December 14, 1970, failed to retard the growth of the IBM plug compatible competition during the first quarter of 1971. After the announcement, Telex and the other plug compatible manufacturers had reduced their own prices below the IBM 2319B price. So at the first meeting following the lowering of prices by the other equipment manufacturers, a study was undertaken of possible alternatives to the rental plan of IBM. During the year 1971 the competitors installed 3,006 spindles equivalent to IBM's 2314. In ensuing months even more were installed.[6] The Management Committee studying the problem estimated that IBM could lose over one-half of its lease base in the disk drive market and could lose up to 20 per cent of its tape lease business to its competitors and that by 1976 it could lose 1,500 printers to Telex.

During this period of time, Telex was gaining considerably in connection with the plug compatible printers and Telex offered a price advantage in that their product could be used without limit.[7]

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6. The District Court found that at this time Telex was IBM's leading competitor in the plug compatible field.

7. Mr. Pfeiffer, President of IBM's Data Processing Division, reported: "Telex is actively marketing their new 1403 plug compatible printer. It is faster, cheaper and has unique on-line or off-line capability. On top of these advantages, Telex offers unlimited use versus our 30% additional use charge on the 1403. This raises the Telex discount from 25% to 40%.

It was also pointed out in the District Court's findings that in 1970 and 1971 the then national recession together with inflation had a severe effect on IBM. At that time IBM offered its equipment either for outright sale or for lease on short-term leases cancellable on thirty days' notice. Due to the economic situation, many of IBM's rental customers were returning their equipment. The competitors, however, were not experiencing this because their equipment was leased for longer periods of time and with termination charges in the event of cancellation. Furthermore, the competitors' prices were lower and this placed even more pressure on IBM's leasing business. Consequently, IBM's sales of EDP were down 50 per cent in 1970 and were the worst in its entire history in 1971.

In the first quarter of 1971, a study was prepared of the plug compatible competition by a Mr. Whitcomb of IBM, who concluded that the plug compatible manufacturing was growing in volume and scope and that this posed a serious threat to IBM's leasing of peripheral equipment. It was estimated that by 1976 IBM would lose 19 per cent of the plug compatible tape market and 28.8 per cent of the plug compatible disk market.

The evidence also showed that notwithstanding the 2319 price cuts, Telex was still a strong competitor. Based on all of this, IBM promulgated a policy to do what was necessary in order to swallow whatever financial pills were required in order to reverse the trend so that the business would be in a growth posture. At an IBM meeting held on April 23, 1971, a Blue Ribbon Task Force was appointed. Soon thereafter, the Task Force reported, recommending drastic price cuts amounting to as much as 50 per

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Since the first of the year, 99 Telex competitive situations have been reported.

"The key attraction to Telex is the unlimited use plan. Our 30% additional use charge is a source of customer irritation as well as expense. . . . We believe that an earlier response to the needs of the marketplace is called for." (PB 52; E 989).

cent on 2314 and 2420 disk drives, but this was rejected by the Management Review Committee in favor of development of a long-term leasing approach.

The Fixed Term Plan was adopted as a result of this (on May 25, 1971).

Effect of the Fixed Term Plan:

The plan called for prices of the competition to be undercut to a considerable extent. At the same time, IBM was to face a reduction in its profits, at least for the first two years. A very considerable increase was contemplated in 1975.

IBM's central processing units were not placed under the Fixed Term Plan. Rather, IBM raised its prices on the central processing units during that period of time. The District Court found that IBM's central processing units price increases were designed to offset the decrease on disk, tape, and printer products placed under the Fixed Term Plan. The basis for this finding of the court was an IBM officer's testimony that the net effect of the Fixed Term Plan and price change would be a wash insofar as business volumes were concerned. The District Court was not unaware of the fact that IBM's competitors had offered lower prices for a number of years prior to the Fixed Term Plan in 1971. They also had previously offered long-term lease plans with cancellation penalty clauses similar to the lease plans of IBM.

Notwithstanding this, the court considered it necessary to analyze IBM's adoption of a long-term lease program solely in the light of IBM's dominant market position. The evidence was ambivalent as to the reasons which motivated the Management Review Committee's review of the Fixed Term Plan. Nevertheless, the court noted that there was an abundance of documentation concerning the views, computations, studies, forecasts, and recommendations of lower managerial personnel within the IBM organization. The District Court determined that in the absence

of full documentation of the intent of IBM officers, it was to be inferred that, in adopting some of the task force recommendations, top management was also embracing the rationale and reasoning underlying those recommendations. The court stated:

> "Moreover, there is considerable direct evidence on vital points to indicate that top management itself did in fact subscribe to the anticompetitive views and objectives of lower echelons."

The court concluded that:

> "IBM's Fixed Term Plan was generated and implemented at the time it was with the primary intent and purpose of suppressing plug compatible competition and to maintain its monopoly power in the plug compatible disk, tape and printer markets and the general plug compatible market for peripheral devices."

IBM's Fixed Term Plan successfully contained the growth of plug compatible competition in the peripheral device market. After June 1971, the plug compatible manufacturers' share of the disk market remained within 17.5 per cent and its share of the tape market did not exceed 15 per cent. But the competitors made a price reduction in response to the Fixed Term Plans.

Despite the response of the competition to IBM's Fixed Term Plan, there was some inability to successfully compete with the IBM Fixed Term Plan. Mr. Rodgers, IBM's Director of Marketing, estimated that the Fixed Term Plan reduced the order rate of the competitors by 50 per cent. The records of IBM establish that 90 per cent of its new disk and tape products were being installed under the Fixed Term Plan and that customer acceptance of it was extremely high (95 per cent).

IBM's internal documents described the anticipated consequences of the Fixed Term Plan upon the competition as follows:

> "The competitor will offer long-term leases similar to IBM's with the base rental initially 10% below ours and declining 5% per year. The competitor will face a new environment; however, in that the bulk of his early installations will represent conversions from PC or IBM 2314's rather than plug for plug replacements of installed 330's. This will be due to the user's reluctance to break the IBM contract due to the penalty payment required. As a result, the competitor will face harder selling and harder installation since he has not yet shown the capability to provide systems, conversion, and application support."

A confidential report issued in December 1971 showed that since the announcement of the Fixed Term Plan there had been a 62 per cent decrease in the competition tape sales rate and in the 4.5 months following the Fixed Term Plan announcement, the competition sales rate for disk drives was off 48 per cent as against the first five months of 1971.

IBM's position at trial was, however, that the Fixed Term Plan did not adversely affect the growth of the competition, pointing to the Telex annual report to shareholders of June 18, 1971, as well as to evidence at the trial showing that Telex products had grown substantially during the period in question. IBM also has argued that there were other reasons for the Telex losses, including loss of business to companies other than IBM.

A Telex report evidencing an investigation made in March 1972 (by Howard Twilley, an administrative assistant to Telex's Chairman of the Board), said:

> "The purpose was to determine to what extent IBM's Fixed Term Plan was responsible for cancellations of Telex orders and to make preliminary contact with potential credibility witnesses.
>
> "Of twenty customers surveyed, only three admit that FTP was a significant factor influencing their decision to cancel Telex in favor of IBM. Furthermore, these three list other reasons in conjunction with FTP . . . No one indicated a willingness to be a witness although this point was not pursued vigorously for fear of damaging future customer relationships.

> "Additionally, this may be a dangerous approach since IBM could probably produce witnesses to the effect that no FTP agreement was signed because the customer knew that Telex would be offering an IBM replacement in the near future, probably at less cost. Survey found that Thiokol Chemical took a monthly lease on IBM 3420's and that Amoco Production did the same in anticipation of replacing them with Telex 6420's." (DB 117; E 2886-2887).

In March 1972, IBM announced its Extended Term Plan, a variation of the Fixed Term Plan. Notwithstanding this, Telex's volume of installations rose remarkably following both the promulgation of the Fixed Term and Extended Term Plans. IBM also maintains that the trial court ignored its own findings when it found predatory conduct in IBM's long-term leases. These findings were to the effect that:

1. The terms of the IBM long-term leases were reasonable and were commonplace commercial agreements.
2. The leases actually reduced IBM's costs.
3. Prior to IBM's Fixed Term Plan announcement, most of IBM's competitors had similar lease plans.
4. IBM's leases were shorter than the mandatory leases which had been judicially approved, notwithstanding that the lessor had been determined to be a monopolist.

The IBM File Adapter:

The trial court rejected Telex's claim that the reduction of the price by IBM of its integrated file adapter for 3330 disk drives constituted a tying arrangement between the file adapter and the 370/135 central processing unit. A particular complaint was focused on the fact that the integrated file adapter or controller could be purchased at a lower price than the independent one. The basis for the trial court's rejection of Telex's contention was that there existed ample evidence to show that the integration represented a valid technological innovation at a decreased cost and that there was no apparent predatory intent.

The Integrated Memory:

The court took a like view to that which it adopted in connection with the file adapter in holding that the integration of the memory component in the IBM central processing unit 370/158 and 370/168 was an adaptation, the primary purpose of which was to achieve cost and performance improvements made possible by reduction in size of the memory component. The court said that the dominant justification was the more efficient performance and cost reduction.

When it came, however, to the FET (Field Effect Transistor) monolithic memory, the court said that the action of IBM in lowering the price of this unit was to erect a barrier to entry of competitors in this particular area. Documents of IBM showed that as early as 1968 IBM recognized that the competition had begun offering memories at a price substantially lower than the IBM price.

A study force had examined the problem in 1969-70 and had concluded that the competition would become viable unless IBM's rental price were below $6,000 per megabyte of FET memory. Subsequently, a memory task force was formed in March 1971 to develop a strategy in conjunction with IBM's announcement of its two new CPU's, Olympus and Pisces.[8]

Prior to the formation of the task force mentioned above, there had been a report of the Management Review Committee in February 1971 which said:

> "The MC is convinced that memory is our next great exposure. In May 1970, there were five competitive memories installed on our equipment. Presently (nine months later) there are 26 main memories and 33 large core storage

8. Referred to under the code name of SMASH (shades of James Bond!).

> memories installed, with 13 on order and over 200 proposed. This is the kind of rapid acceleration which we experienced in the tape and disk area. As you know, peripherals, including memory, is a Key Corporate Strategic Issue and the MC plans to spend considerable time on the subject."

In an earlier Management Review Committee meeting it had been said (by Mr. Carey) that there was not an appropriate technical solution to the problem and, therefore, that repricing was the only alternative available.

There was testimony at the trial from a member of the task force studying this, Mr. Hochfeld, that the task force's purpose was to analyze various alternatives open to IBM in order to stem the potential threat from plug compatible memories.

A recommendation made in June 1971 to the Management Review Committee by IBM's top executives was to reduce the price of the memory and increase the price of the central processing unit accordingly. This viewpoint was reviewed by the Kenyon House Task Force which reached a similar conclusion, in other words, recommending that the rental price for memory be reduced and that the rental price for the central processing unit be increased. The announcement made on August 2, 1972, with regard to the new central processing units 370/158 and 370/168 adopted this approach. Thus, memory prices were lowered to $5,200 per month rental per megabyte, this rental being less than the amount a potential competitor would need to charge in order to enter the market. At the same time, the CPU rental prices were raised in a proportionate amount.

The trial court found that the central processing unit price was raised from $20,600 to $30,700 on the new units, a price which the court also found to be higher than the amount necessary to reflect improvements. On the 370/168, the raise was from $36,400 for the prior model to $48,600 on the new one which also constituted an increase which did not accurately reflect the improved performance.

At trial Hochfeld testified for Telex that when IBM dropped its memory price to $5,200 rental, it was impossible for a potential competitor to enter the field and to compete successfully with IBM. Unquestionably the increased price of the central processing units coincided with the decrease in the price of the memory units. However, the low rental price on the memory did not prevent Telex and other competitors from entering this market with units designed to rent for prices below the $5,200 per megabyte per month.

IBM here contends that the trial court was in error in holding that these price reductions were invalid because the products were new technologically and were forty times smaller than the core memory which plugged into the old unit. The manufacturing cost of this was also smaller. While the court recognized that the price of the new memory unit charged by IBM was based on a 20 per cent profit margin and was therefore reasonable, the court concluded nevertheless that it was predatory.

The effort to reverse the court's finding is based on its alleged failure to take cognizance of the fact that the product was a new one which was much more efficient than the old and that the studies which predicted the impossibility of competitors entering the market were based not on the new technology but, rather, on the old more expensive core memories. In actuality, the evidence of IBM showed that Telex could produce these at $2,700 per unit or $8,000 for three units. IBM's further contention is that Telex suffered no actual damage since it was unable to build the memory without illegally obtaining IBM's trade secrets. There were other reasons why, according to IBM, Telex could not produce memories at the times in question inasmuch as they could not get the parts or the material; this was not the fault of IBM.

On appeal IBM has continued to argue that its increase of price on the new central processing units was not linked to the reduction of the memory price, pointing out the vast amount of capital

which was needed to develop the new central processing units and the very substantial improvement of the new machines over the older units, including many new features, and new and different parts. For these reasons, IBM contends that the prices of both the CPU's and the memories were reasonable, plainly profitable, and independently justifiable.

III.

THE AWARD OF DAMAGES TO TELEX BASED ON ITS COMPLAINT

The original award of damages was in the amount of $359.2 million. However, in the amended opinion this amount was reduced. The court was seeking to correct what it regarded as its original error which was reducing the award after trebling instead of before. The amended award was in the total amount of $259.5 million plus $1.2 million in attorneys' fees and costs. The particular elements of damage which the court found were:

1. $70 million attributable to loss of market share which the court held Telex would have retained had it not been for the illegal acts of IBM.

2. $39 million in loss of rental profits which Telex would have earned on its leases had it not been forced to cut prices because of IBM's illegal acts.

3. $8.5 million in loss of sales profits which Telex would otherwise have earned on specific sales had it not been forced to lower prices because of IBM's illegal acts.

The court's initial figure was adjusted prior to trebling. The adjustments were as follows:

1. Reduction of actual damages by $6 million because of the curative effect which would result from the injunctive relief awarded.

2. An additional reduction of $17.5 million, representing the "best available quantification" of advantage obtained by Telex

through illegal activities in establishing its market position upon which antitrust damages were initially determined.

3. A further reduction of $7.5 million, representing an approximation of further unlawful competitive advantage obtained by Telex through misappropriation of IBM trade secrets, this amount not being quantified in the direct proof of findings, but which the court felt should operate to reduce damages prior to trebling. Reduction of the initial $117.5 million by $31 million resulted in adjusted damages of $86.5 million. The court then trebled this figure under the provisions of 15 U.S.C. § 15, resulting in total damages of $259.5 million.

Underlying Theory of the District Court in Its Award of Damage to Telex:

Having found and concluded that IBM had violated the antitrust laws, the court awarded damages on the following bases:

First, Telex established by a preponderance of the evidence the fact of injury, in that IBM's violations had produced substantial impact to the business of the plaintiffs. The court was satisfied that the impact was sufficient to satisfy plaintiff's burden of proof.

Secondly, the court acknowledged that the specific amounts of damages had not been clearly demonstrated by Telex and that the evidence was insufficient to justify the award of the amounts demanded by Telex.

Third, the court applied the principle that where a plaintiff has established injury in fact, it need not under the law establish the specific amount of damages with certainty. The court rejected the doctrine or approach that it was necessary to tie damage directly and specifically to antitrust violations in specific amounts. Rather, the court used a broad-gauged approach of fair and reasonable approximation. Due to the complexity of the case, the court noted the impossibility of quantifying the damages in detail. It concluded:

". . . Notwithstanding the difficulty involved, I have found that there is reasonable basis in the evidence to fairly approximate the damages to which plaintiffs are entitled as proximately caused by the unlawful acts and conduct of the defendant."

Fourth, as a justification for its decision, the court stated that its function was similar to that of a jury determining the amount of damages. The court recognized the requirement of Rule 52(a) that the court must make specific findings of fact, but concluded nevertheless that approximations of total damages are more appropriate than detailed and minute findings allocating portions of claims going to make up the finding of the ultimate fact of damage.

In utilizing Telex's damage evidence three points were emphasized:

(a) That Telex's evidence was good faith information, not prepared merely for the purposes of litigation.

(b) That Telex had presented the court with the best information available.

(c) That the inability of the court to determine damages specifically was due to the factual complexities which resulted from IBM's violations. Because of this, the court concluded that the burden of the uncertainty had to be shouldered by IBM.

The $70 million loss of market share was estimated on the basis that Telex was entitled to receive damages for loss of profits from the market share of plug compatible peripherals which it would have acquired had IBM not interfered (by, according to the court, committing antitrust violations). To determine what Telex's market share might have been, the court relied on two Telex market forecasts. One was prepared in November 1970 and the other on January 12, 1972. The difference between these two forecasts represented the segment of the market share which Telex had lost in the intervening period. At the same time, the court said that these two forecasts should not be given full face

value. Telex itself had, according to the court, failed in its efforts through its own fault. Taking this into account, the court awarded damages for loss of market share in the amount of $70 million. The court did not explain how it arrived at this number.

The sum of $39 million was awarded to Telex to compensate it for its loss in rental profits because of its having been forced to cut its prices by IBM's reducing its prices. Here again, the court discounted the estimated loss to make an allowance for factors which do not involve IBM's violations of the antitrust laws and came up with the sum of $20 million on rental profits prior to April 1, 1972. The sum of $19 million was attributable to lost rentals reasonably to be anticipated after March 31, 1972.

On loss of sales profits, Telex claimed the sum of $11.3 million. This again was allegedly due to the lowering of sales prices and hence its profits. The losses included $8.5 million lost profits in a sale to Pepsico, $1.3 million on the Hudson disk transaction and $1.5 million on the Transamerica disk transaction. In response to Telex's evidence, IBM introduced evidence that many other variables other than IBM's activities could have caused a decrease of Telex's profits in these sales. Damages were awarded in the amount of $8.5 million, a reduction from Telex's claim. This again was another approximation.

The reductions referred to above in the award prior to trebling were:

1. The adjustment of $6 million representing the correct or diminishing effect of the injunctive relief granted against IBM on the damages otherwise recoverable.

2. A reduction of $17.5 million representing Telex's trade secret violations against IBM. This $17.5 million involved losses which IBM suffered as a result of Telex's conversion of IBM's trade secrets.

The reason for deducting these amounts from the damages on the complaint was that Telex's projected market share upon

which damages were based included Telex's competitive advantage derived from misappropriation of trade secrets. The court did not feel that this loss of competitive edge was properly compensable because it was not based on a violation of Telex's legal rights.

There was a further reduction in the amount of $7.5 million prior to trebling representing additional unlawful competitive advantage realized by Telex through misappropriation of IBM's trade secrets. This also was a generalized amount. The court gave no indication as to how it arrived at this.

IV.

IBM'S COUNTERCLAIM AGAINST TELEX AND THE DAMAGES AWARDED TO IBM

The District Court's findings and conclusions described a pattern on the part of Telex during the whole period in question of manufacturing products which were plug compatible with the IBM central processing units. According to further findings of the trial court, these were almost exact copies of IBM peripheral products. Telex would introduce these on the market to compete with the IBM devices. This practice had been followed by Telex starting in 1966 in the tape drive area and in 1969 in the disk drive area. Telex had also marketed copies of IBM memory and printer devices. These Telex products were priced substantially less than the price of the IBM products. Telex sought to introduce these copies to the market as soon as possible after the IBM products had been introduced.

Telex was able to keep abreast of IBM in the production of IBM's copies only by the hiring of employees or former employees in order to ascertain what IBM was doing or planning to do. This pirating of information was carried out by the employment of key personnel capable of developing the Telex technology in IBM peripherals on the basis of IBM designs. There

were numerous such employees hired by Telex. The District Court stated that the number of IBM employees so hired was not statistically significant, but the employees who were hired were key personnel.[9]

The court said that the IBM employees had furnished an important and vital part of Telex technology and development. The court then went on to say that in March 1970, for example, Telex hired Jack James, who possessed substantial confidential information about IBM's future production plans. He had been approached by an employer of Telex regarding the possibility of resigning from IBM and taking a position with Telex. The court went on to find that James had access to confidential data relating to IBM products under development. He was furnishing information to Telex even while on IBM's payroll. The court in Finding 138 outlined the various IBM products that James had had access to and delivered to Telex. These included confidential informa-

9. Finding 134 details this as follows:

"Statistically, the number of IBM employees hired by Telex has not been impressive. Of those personnel who had formerly been employed by IBM some of them were employed by Telex after intervening employment by third parties and some were employed immediately after the termination of their employment at IBM. On March 31, 1970, Telex employed 50 engineers of whom one was a former employee of IBM. On March 31, 1971, Telex employed a total of 88 engineers, of whom 18 were former IBM employees, 8 of these were employed directly from IBM. On March 31, 1972, Telex employed a total of 145 engineers, of whom 31 were former IBM employees; 13 of these were employed directly from IBM positions. On March 31, 1973, Telex employed a total of 129 engineers, of whom 12 were former IBM employees; 3 of these were employed directly from IBM. The remainder of Telex's engineering staff was employed after no previous IBM experience. They were obtained either directly from schools or with work experience from self-employment or from some 60 other employers. One of the principal sources of engineering personnel was RCA, which abandoned its electronic data processing venture in 1971; a total of 32 of Telex engineers employed as of March 31, 1973, came to Telex directly from RCA. On March 31, 1973, Telex had total employees of 1,929, of whom 152 had former IBM employment experience."

tion concerning IBM products under development and its future plans and forecasts, especially as to IBM's Plan 25 Forecast and its SCAN Forecast. James copied large amounts of information from IBM confidential documents and delivered this to Telex when he arrived there. Telex was allowed, as a result, to conform and adjust its production strategy, entering many new production areas and offering a much broader production line in peripherals in 1970 than it had offered in 1969. According to further findings of the court, this constituted deliberate misappropriation by James in violation of his agreement with IBM not to disclose such confidential information. Telex knew that it was confidential and that it had been unlawfully appropriated or should have known. The court further found that Telex officials fully expected and intended James to appropriate this information.

One particular item furnished by James was information about IBM's new Aspen 3420 tape drive announced by IBM in November 1970. Based on this information, Telex decided to produce a copy of the Aspen and in furtherance of this hired Howard Gruver, an IBM engineer in charge of the Aspen control unit development project. Gruver, the court found, disclosed IBM trade secrets in violation of his agreement with IBM not to do so, whereby Telex was able to produce an Aspen-type product by November 1971, ten or eleven months, according to the court, sooner than it would have been able to do without the copy and the information. The court determined that the misappropriation resulted in Telex's unjust enrichment in the amount of $4.5 million in monthly rentals of the Aspen tape units and an additional $3 million in other losses. Other products which were expanded as a result of this kind of practice was the disk file subsystems and IBM Merlin 3330 disk file subsystem which was announced in 1970.

In November 1970, Telex hired John K. Clemens, who had been IBM's engineering program manager for the Merlin project.

Clemens was fully informed of the aspects of this program, including the development and design, manufacturing, sales, and forecasts. He was hired for the purpose of developing a Merlin-type disk storage system for Telex. In addition to a substantial salary and stock options, Clemens was given a $500,000 bonus if he produced a Telex Merlin-type system for delivery to a Telex customer prior to November 30, 1972. Telex also set out to hire other key personnel in connection with IBM's Merlin project offering them high salaries, bonuses, and stock options. Telex needed to develop this in eighteen months, a schedule which the court found would have been impossible without the thefts since it had taken IBM five years to develop the project. Telex knowingly and intentionally used the IBM trade secrets and hired a number of new employees in order to bring this about. The court concluded that Telex succeeded in misappropriating IBM's trade secrets and appropriating them into the Telex 6830.[10]

The trial court also found that Telex had misappropriated the source code to IBM's "FRIEND" Version 2 diagnostic program, a coded computerized program utilized in the diagnosis, checkout, and debugging of various devices in a computing system. Necessary to the use of the "FRIEND" device was the source code. IBM considered it as confidential property and it was secured carefully. The court found that one of the IBM employees hired by Telex took a copy of the source code with him to Telex and that Telex used this misappropriated material in order to develop a Merlin-type disk file system. The court further found that when

10. Telex never actually completed its project of copying a Merlin-type subsystem, but stopped work on the project in April 1972, at which time the court estimated that it had completed more than half of the work on the project. In May 1972, Telex sold its rights to the Merlin-type project under a license agreement to Control Data Corporation. The court found that at the time of abandonment of the project in April 1972, as a proximate result of improper utilization of IBM trade secrets, Telex had unjustly enriched itself at IBM's expense in the amount of at least $10 million.

Telex sold that project to the Control Data Corporation in May 1972, it also sold the "FRIEND" source code to Control Data for $500,000.

The trial court also found that Telex had used the same unlawful conduct and practices in obtaining memory products, communications controllers, and central processing units. However, the court was unable to determine the amount of damages sustained by IBM in these areas or the amount of unjust enrichment to Telex.

As to the statute of limitations, the trial court held that it did not apply because Telex had fraudulently concealed the fact that they had misappropriated IBM's trade secrets.

The court did find that as a result of Telex's misappropriation efforts IBM was compelled to spend much greater amounts of money for security protection than it would have had to spend had Telex not been misappropriating its secrets. The court determined that the damage to IBM resulting from this was $3 million. Also, the court found that as a direct result of Telex's illegal activities IBM had to itself manufacture certain particularly sensitive products parts; that it was unable to contract out this work. This produced damages to IBM in the amount of $400,000.

It was also found by the court that in its misappropriations and related conduct, Telex's conduct was planned, deliberate, and wilful, whereby IBM was entitled to exemplary damages in the amount of $1 million.

In Findings 178-187, the District Court detailed the evidence pertaining to Telex's established copyright violations. The court found that Telex had copied all or substantial portions of the IBM manuals dealing with the operation and servicing of IBM's tape drives and tape subsystems, disk drives, tape controllers, and central processing units. After copying these manuals Telex distributed them with its IBM equivalent equipment. All of these

manuals were protected by valid copyrights and the portions copied were not trivial.

V.

POINTS ADVANCED BY IBM

A. Relevant Market:

The main quarrel of IBM with the court's determination of the relevant market is that it is limited mainly to peripheral products plug compatible with IBM's equipment. It encompasses only part of the peripheral equipment marketed by Telex and the other plug compatible manufacturers. It fails to include the peripheral equipment market by systems manufacturers other than IBM.[11]

Also, the court zeroed in particularly on these products: tapes, disks, printers, memories, and communications controllers, finding each to be a relevant submarket. Memories are included, notwithstanding that the court regarded them as outside the definition of peripheral products. IBM also complains that although the court found that users of computers can alternate between printers, terminals and computer output microfilm devices, it did not indicate which of these should be included within the printer submarket, and notwithstanding interchangeability between other peripheral devices such as disks and tapes, it failed to include these in the same submarket. It is said from this that the District Court was inconsistent and illogical in defining the relevant market.

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11. Over 250 companies manufacture peripheral devices for use in non-IBM computer systems, and 100 of these companies supply peripheral products for IBM systems. Because it is relatively easy to adapt peripheral equipment for installation in another system, most companies (including Telex) market their equipment for installation in more than one system. Thus, the "plug compatible" peripheral equipment marketed for use in one system is the same as that marketed for use in another system, except for a necessary change in the "interface." IBM claims that the cost of modifying an interface so that it can be used with another system amounts to less than 1% of the product's purchase price.

B. The Finding of Monopoly Power:

In support of its contention that it did not have monopoly power, IBM cites that its share of the computer systems industry amounted to 35.1 per cent and that its share of computer hardware was limited to 36.7 per cent. Further, that its share of total peripheral equipment was limited to 45.6 per cent of the tape market, 38.3 per cent of the printer market, and 30.3 per cent of the disk and memory market. IBM points out that the court's finding as to the possession of IBM of monopoly power is inconsistent with its findings that there existed substantial competition between IBM and other manufacturers in the area of peripheral products. IBM also complains that the trial court was unfair in including new IBM products which had not yet been copied by other plug compatible manufacturers. Obviously, IBM had 100 per cent of these markets but averaging 100 per cent gives a distorted picture.

Finally, IBM maintains that the touchstone of monopoly power is ability to charge unreasonably high prices and to exclude competition. The court did not find that IBM had either of these abilities, although the court did adopt this legal test.[12]

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12. IBM maintains that even assuming that the relevant market was correctly defined, IBM lacked monopoly power for the following reasons:

1. Expert economic witnesses for both parties agreed that, absent control over the entry and growth of competitors, there is no monopoly power. In the plug compatible peripheral industry, the number of companies supplying peripherals has grown from three in 1966 to over 100 in 1974. Such entry into the market has been relatively easy since the PCM merely copies the products originated by IBM.

2. The dramatic improvement in product performance together with the reduction in the price of peripherals disproves monopoly power. Progressively better products at progressively lower prices were not present in cases where monopolization existed.

3. The rapid rate at which IBM's PCM competition has taken peripheral business from IBM in the last five years is inconsistent with the existence of monopoly power.

4. The sophistication, power, and knowledge of computer customers have put pressure on IBM and its competitors. Because sophisticated customers are able to demand and select the best, the number of competitive alternatives has increased, making success in the peripheral market well earned and difficult to achieve.

5. The growth, innovation, and increasingly technological changes in peripheral products are antithetical to the stagnancy which characterizes monopolization.

6. Competition by superior business skill, better products, and greater efficiency, industry, and foresight do not give rise to monopolization. These qualities are allegedly responsible for IBM's success in the market.

7. Many competitive systems manufacturers (*e.g.* Control Data, Burroughs, Digital Equipment Co., Hewlett-Packard, Honeywell) supply plug compatible peripherals for installation in IBM systems. The ease with which other EDP systems companies can enter into the IBM market is further evidence of the increase in competition in the peripherals industry.

8. IBM's continual introduction of new products does not constitute monopoly power, but represents the historic, legitimate, and merely temporary advantage of the innovator over the copier.

IBM also points out that the object of the Sherman Act is to prevent price fixing, control of supply, and deterioration in quality of the monopolized products. It says that none of these problems exist in the case at bar.

C. Predatory Conduct:

IBM contends that the court erred in finding that predatory conduct existed because it is wholly out of harmony with IBM's lower prices, improved products, and new leasing terms, all of which were responsive to competitive activities and pressures. Attention is called to Findings 88, 95a and 111a, wherein the court admitted that the legality of IBM's responses were competitive, but holds that the conduct was predatory because of the economic power of IBM. It is said that IBM's actions were wholly lawful in themselves, but became unlawful only because of IBM's size.

It is said that this view is erroneous because IBM's conduct was lawful, involved a reasonable profit, and was responsive to the acts of its competitors, in harmony with the purpose of the Sherman Act to foster competition and give healthy economic results—better products at lower prices.

It details in its arguments the reasons why the 2319 product price offerings were not predatory and why the long-term leases were not, and also why the new memory at a lower price was not predatory.

D. The Award of Damages:

IBM contends:

1. The awards are vague and are not founded on specific findings. Therefore, they do not comport with Rule 52(a).

2. There is no effort on the part of Telex to prove that any activity of IBM caused the damage or that it was the probable consequence of IBM activity.

3. The difference between the original award and the amended one illustrates the arbitrary and speculative approach that the court employed.

4. It failed to prove particularly that the award to Telex for inability to produce and sell memories was based on anything that IBM had done or had failed to do.

5. The future losses recognized by the court were wholly speculative.

VI.

TELEX'S CROSS-APPEAL CONTENTIONS

A. Appropriation of Trade Secrets:

1. Telex claims that the court erred in its award of damages based upon the misappropriations because it derives largely from the hiring of former IBM employees and the paying of large bonuses to them to produce copies of IBM products. It is said by Telex that the damages which the court found amounting to $20.9 million is based largely on circumstantial evidence.

2. Telex says that it did not invade IBM's rights because they were free generally to copy those products that were on the market and thus in the public domain. Further, that these were not secrets;

that they were known throughout the industry and neither innovative nor novel. Finally, they maintain that IBM was misusing their secrets in any event; that they were furthering their monopolistic activities with them and therefore the secrets were so contaminated that no recovery could be allowed.

3. A specific objection is raised as to the $4.5 million lost on tape rentals and $3 million in indeterminate damages. Telex says that there is no way of knowing whether IBM would have had the $4.5 million and says that the $3 million award is too vague.

4. Regarding the award of $10 million to IBM based on misappropriation of trade secrets growing out of IBM's Merlin disk system, Telex says that it abandoned this matter midway in its development and sold it to another corporation. Since it never finished its program, IBM did not suffer any damages. It says that the $10 million award really represented the sum that Telex would have lost in its attempt to copy Merlin had it not used IBM's trade secrets. It says that it was impermissible for the court to use this kind of an approach to the award of damages.

5. Telex contends that the award of $3 million to IBM for increased security expenses and the award of $400,000 resulting from having to manufacture a component in-house due to fear of misappropriation were ill-founded awards. It says that it should not be penalized for IBM's apprehensions about security.

6. Telex also contends that it was error to award the punitive damages. It argues that the award is inappropriate in view of the IBM antitrust violations.

VII.

CONSIDERATION OF THE ISSUES.

1. The Relevant Market

The threshold issue is whether the court erred in its findings as to the scope and extent of the relevant product market for determination whether there existed power to control prices or to

exclude competition, that is, whether there was monopoly power. As heretofore pointed out, the court determined that the relevant product market was limited to peripheral devices plug compatible with IBM central processing units together with particular product submarkets; magnetic tape products, direct access storage products, memory products, impact printer products and communication controllers, all of which were plug campatible with an IBM CPU. IBM had sought a determination that the relevant product market consisted of electronic data processing systems together with the products which are part of such systems or at least that the relevant product market should consist of all peripheral products and not be limited to those currently attached to IBM systems.

The trial court's initial approach to the problem was restricted to consideration of whether the market "may be realistically subdivided in the time frame 1969-1972 to focus on and encompass only those parts of current product lines which are respectively attached to IBM systems rather than all those products which actually have similar uses in connection with other systems." The court recognized that inasmuch as every manufacturer, originally at least, has 100 per cent of its own product, including the peripherals, the likelihood of finding monopolization in this area increases as the circumscribing products market is more circumscribed.[1]

The trial court also recognized that the cost of adaptation of peripherals to the CPUs of other systems is roughly the same with respect to every system, that is, the cost of the interface, the attachment which allows the use of peripherals manufactured by one system to be used on another central processing unit is generally about the same. But these practical interchange possibilities did not deter the court in reaching a conclusion that the products market was practically restricted. A factor which influenced the trial court was the commitment of Telex to supplying peripherals plug compatible with IBM systems. The court appeared to disregard the interchangeability aspect of the peripherals manufactured by companies other than IBM, giving emphasis to the fact that Telex, for example, had not chosen to manufacture such peripheral products of the kind and character manufactured by companies other than IBM.[2] The trial court did, however, recognize the presence of interchangeability of use and the presence of cross-elasticity of demand. The court thought, however, that the presence of these factors were not sufficiently immediate.[3]

1. *See* Finding 37.

We recognize that market definition is generally treated as a matter of fact and that findings on this subject are not to be overturned unless clearly erroneous. Our question is, therefore, whether it was clearly erroneous for the court to exclude peripheral products of systems other than IBM such as Honeywell, Univac, Burroughs, Control Data Corp. and others, together with peripheral products plug compatible with the systems and, indeed,

2. Findings 52 and 53 are as follows:

"F52. The court finds that the peripheral devices plug compatible with the CPU's of IBM may be considered the relevant market for the purposes of this case, and that relevant submarkets existed for plug compatible tapes, disks, memories, and printers with their respective controllers, and communications controllers.

"F53. CPU's are not reasonably includable within this market and these submarkets, nor are software as such, but the peripheral equipment plug compatible to IBM CPU's which are separately leased by leasing companies to end-users are. Alternate sources of computer time such as service bureaus, time-sharing companies, data centers, users selling excess time and the like are not reasonably includable in the relevant market or submarkets with which we are concerned in this case, since their competitive relationships are tangential and indirect, and do not supply a real or substantial competitive force in the relevant markets mentioned. It is true that a large part of the competition in the industry takes place on a systems basis, but the relationship of this competition to the relevant markets with which we are concerned against its tangential and practically indiscernable. Certainly in another context the competition between systems manufacturers would constitute, or be a part of, a relevant market, but such relevant market is not material under the facts of this case since the competition involved here is not between systems manufacturers but between IBM and plug compatible manufacturers and suppliers.

3. This is all expressed in the court's final wrap-up on this factual issue.

whether the systems themselves manufactured by the companies are to be taken into account. It is significant, of course, that peripheral products constitute a large percentage of the entire data processing system, somewhere between 50 and 75 per cent.[4]

Inasmuch as IBM's share of the data processing industry as a whole is insufficient to justify any inference or conclusion of market power[5] in IBM, the exclusion from the defined market of those products which are not plug compatible with IBM central processing units has a significant impact on the court's decision that IBM possessed monopoly power.

We then must inquire whether this market definition was correct in light of the following factors:

1. Should peripheral products not plug compatible with IBM systems be considered part of the relevant market in view of the existence of easy and practicable interchange of these products by use of interfaces designed for this purpose?

2. Should not the peripheral products plug compatible with systems other than IBM be considered part of the relevant market because of the admitted competition existing as between system manufacturers on a system by system basis in which the peripherals are a significant part of the system?

In dealing with the issue whether peripheral products non-compatible with IBM systems ought to be considered, the court said in Finding 47 that as a *practical* matter there is no direct competition between IBM peripherals and the peripherals of other systems manufacturers. However, this finding is out of harmony with other findings which the court made. *See*, for example, Finding 38, wherein the court said that "It cannot be gainsaid that indirectly at least and to some degree the peripheral products attached to non-IBM systems necessarily compete with

4. *See* Finding 38.

5. *See* Finding 61. For example, according to the U. S. Bureau of the Census figures, IBM's share of the value of 1971 equipment of "electronic computers and peripheral equipment, except parts," was only 36.7 per cent.

and constrain IBM's power with respect to peripherals attached to IBM systems." The court also stated in Finding 38 that:

> ". . . [S]uppliers of peripherals plug compatible with non-IBM systems could in various instances shift to the production of IBM plug compatible peripherals, and vice versa, should the economic rewards in the realities of the market become sufficiently attractive and if predatory practices of others did not dissuade them. In the absence of defensive tactics on the part of manufacturers of CPU's, the cost of developing an interface for a peripheral device would generally be about the same regardless of the system to which it would be attached, and such cost has not constituted a substantial portion of the development cost of the peripheral device."

The factor of ease of designing interfaces to allow interchange of peripherals was obviously troublesome to the court and this trouble continued after the court had rendered its decision. He was still treating the issue on October 17, 1973, in the post-trial hearing. *See* Court Papers, 445-446. The court's final words on the subject were:

> "I'm down to the edge lawn, and I think the best service I can do is to speed the matter to that final determination. If I'm wrong on my market definition, then you did what you had a right to do."[6]

6. Additional light on this subject is derived from Mr. Grant, senior vice president of Telex, who stated:

> "Q. How about this problem with interfaces, Mr. Grant? Generally speaking, on these peripheral products, what is involved in changing the interface from an interface which will plug in with an IBM system and one which will plug in with another system? A. I don't think I'm qualified to give you an answer to that.
>
> "Q. Sir? A. I don't believe I'm qualified to give you an answer to that.
>
> "Q. Well, you believe, don't you sir; and have said many times before, within the company, that the expense in order to change interfaces is minimal, haven't you?
>
> A. I have said that the engineering expense associated with the development of interfaces is a minimal expenditure.
>
> "Q. And you have been an advocate, have you not, of modifying the interfaces in a way that would enable Telex to attach its

In essence, this witness said that the engineering costs of developing interfaces was minimal and that he had advocated modifying interfaces so that Telex products could be used with systems other than IBM. Another example of ease of interface design is shown by the fact that following RCA's decision to abandon the computer systems business and turn it over to Univac, Telex recognized a marketing opportunity and it began marketing its 6420 tape unit, the plug compatible equivalent of IBM's 3420 Aspen tape unit, as a plug compatible unit with RCA CPUs. The documents sought to emphasize the ease of use in the RCA system of this peripheral equipment designed for IBM equipment originally.

Still another exhibit in the record recognizing the practicability of interface change on peripheral equipment is a February 4, 1972, memorandum of R. M. Wheeler, Chairman of the Board of Telex, requesting a letter or his signature which could be sent to systems manufacturers. This letter was to be sent to systems manufacturers. It offered to sell peripheral equipment plug compatible with the central processing units of the manufacturers. Specific reference was made to the 6420 tape unit, among others, which would normally be compatible to IBM's central processing unit. The Wheeler letter stated that Telex would be willing to interface their equipment at no cost to the purchaser.[7]

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products to systems manufactured by other system manufacturers other than IBM? A. Yes, I have.

"Q. How long Mr. Grant, have you urged upon your fellow officers at Telex, that Telex ought to modify its interfaces and offer its products for attachment to other systems other than IBM. A. I don't recall, specifically, but in the general area—the initial request and the initial effort was approximately two or two and a half years ago."

7. One of the points of information which Wheeler wished to have included in his letter was the following:

"(f) We would be willing to interface our equipment with their mainframe at no cost to them and offer this equipment on lease to their customers if they would prefer this route (this would be a mild threat that we could possibly compete with them in the market place if they didn't get on our band wagon."

Manufacturers of peripherals were not limited to those which were plug compatible with IBM CPUs. These manufacturers were free to adapt their products through interface changes to plug into non-IBM systems. It also followed that systems manufacturers could modify interfaces so that their own peripheral products could plug into IBM CPUs. Factually, then, there existed peripheral products of other CPU manufacturers which were competitive with IBM peripherals and unquestionably other IBM peripherals were capable of having their interfaces modified so that their peripheral products would plug into non-IBM's CPU.

The fact that Telex had substantially devoted itself to the manufacture of peripheral products which were used in IBM CPUs and which competed with IBM peripheral products cannot control in determining product market since the legal standard is whether the product is reasonably interchangeable.

This standard was laid down by the Supreme Court in the famous case of United States v. DuPont de Nemours & Co., 351 U. S. 377, 76 S. Ct. 994 (1956). In this case, as in the case at bar, the scope of the products market was crucial. The Supreme Court determined that if one product may substitute for another in the market it is "reasonably interchangeable." It was applied there even though DuPont largely controlled the production of cellophane. It was held to be not guilty of monopolization simply because the relevant market included cellophane as well as other flexible wrapping materials. On this the Court stated:

> "[W]here there are market alternatives that buyers may readily use for their purposes, illegal monopoly does not exist merely because the product said to be monopolized differs from others. If it were not so, only physicially identical products would be a part of the market." 351 U.S. at 394.

One evidence of cross-elasticity is the responsiveness of sales of one product to price changes of another. But a finding of actual fungibility is not necessary to a conclusion that products have potential substitutability. In this respect the Court said:

> "Every manufacturer is the sole producer of the particular commodity it makes but its control in the above sense of the relevant market depends upon the availability of alternative commodities for buyers; i.e., whether there is a cross-elasticity of demand between cellophane and the other wrappings. This interchangeability is largely gauged by the purchase of competing products for similar uses considering the price, characteristics and adaptability of the competing commodities." 351 U.S. at 380.

The Court's further rendition of examples clarified its ruling:

> "Determination of the competitive market for commodities depends on how different from one another are the offered commodities in character or use, how far buyers will go to substitute one commodity for another."

The Court then turned its attention to the analogy of building materials and said:

> "For example, one can think of building materials as in commodity competition but one could hardly say that brick competed with steel or wood or cement or stone in the meaning of Sherman Act litigation; the products are too different. . . ."

The Court continued:

> "On the other hand, there are certain differences in the formulae for soft drinks but one can hardly say that each one is an illegal monopoly." 351 U.S. at 393.

It is helpful to consider the rulings of lower courts based on the *DuPont* decision. An example is United States v. Charles Pfizer & Co., 246 F.Supp. 464 (D.C.N.Y. 1965), where the court applied the ruling of *DuPont* that complete identity of use is not a prerequisite to a finding of interchangeability. The Government had argued that the defendant had a monopoly in the citric acid market. The record, however, disclosed that citric acid was in competition with lactic acid, tartaric acid, phosphoric acid, and fumaric acid in its uses in the food and beverage industry. Since these different products were functionally interchangeable, the court decided that the relevant market included all such acidic products, and on that account the Government was held to have not proven that the relevant market was solely the citric acid market.

In still another case, Advance Business Systems & Supply Co. v. SCM Corp., 287 F.Supp. 143 (D.C.Md. 1968), the plaintiff sought to establish that the relevant market was restricted to the paper used in SCM machines, but the court delineated the product market in much broader terms:

> "When SCM introduced its first machine it had a natural monopoly for a few months of the sale of paper and other supplies for use with that machine. But competition quickly developed for the sale of paper, and by 1965 for replenisher. The evidence shows that SCM has attempted by various means to keep for itself the sale of paper for use in its own machines. If paper for use in SCM machines is a relevant market, which one may attempt to monopolize in violation of section 2 of the Sherman Act, SCM has made such an attempt. But the facts in this case do not show that the relevant market should be defined in such unrealistically narrow terms. The relevant submarket is the sale of coated *paper for use in SCM and other machines* which employ the direct electrostatic process." 287 F.Supp. at 153-154 (Emphasis added).

So here again the relevant product market included not only SCM's paper but also paper manufactured for use in other machines inasmuch as these products were reasonably interchangeable within the meaning of the *DuPont* case.

In South End Oil Co. v. Texaco, Inc., 237 F.Supp. 650 (D.C. Ill. 1965), the court found that there was no monopolization and again on the basis that the product market as defined by the plaintiff was too limited. The court said that where commodities are competitive and reasonably interchangeable, the relevant market is not to be confined to the products of one manufacturer.

One of the most significant decisions of all is that of the Supreme Court in United States v. Grinnell Corp., 384 U.S. 563, 86 S.Ct. 1698 (1966). In the opinion of Mr. Justice Douglas who had dissented in *DuPont*, the *DuPont* case is cited approvingly. The opinion recognizes that substitute products are to be included within the definition of relevant market "since customers may turn to them if there is a slight increase in the price of the main product." 384 U.S. at 572. The relevant market in *Grinnell* was broadly defined and included the entire accredited central station service business involving such systems as automatic burglar alarms, automatic fire alarms, sprinkler supervisory service, and watch signal service. The basis for combining these various products was that all of them provided protection of property.

The consequences of the Court's holding are very clear; there can be no ruling of monopolization where the issue is judged on the basis of the entire market rather than a small segment of it. *See* the decision of the Fifth Circuit in Cliff Food Stores, Inc. v. Kroger, Inc., 417 F.2d 203 (5th Cir. 1969). In footnote 2 the court said that the essence of monopoly is that "power exists to raise prices or to exclude competition when it is desired to do so." American Tobacco Co. v. United States, 1946, 328 U.S. 781, 811, 66 S. Ct. 1125, 1140, 90 L.Ed. 1575. The court went on to say that:

> ". . . it appears that something more than 50% of the market is a prerequisite to a finding of monopoly. *See, e.g.*, Standard Oil Co. v. United States, 1911, 221 U.S. 1, 31 S.Ct. 502, 55 L.Ed. 619 (90%); United States v. Paramount Pictures, Inc., 1948, 334 U.S. 131, 68 S.Ct. 915, 92 L.Ed. 1260 (70%); and United States v. Grinnell Corp., 1966, 384 U.S. 563, 86 S.Ct. 1698, 16 L.Ed.2d 778 (87%). . . ."

It seems clear that reasonable interchangeability is proven in the case at bar and hence the market should include not only peripheral products plug compatible with IBM CPU's, but all peripheral products, those compatible not only with IBM CPUs but those compatible with non-IBM systems. This is wholly justifiable because the record shows that these products, although not fungible, are fully interchangeable and may be interchanged with minimal financial outlay, and so cross-elasticity exists within the meaning of the *DuPont* decision.

The court's very restrictive definition of the product market in the face of evidence which established the interchangeable quality of the products in question, together with the existence of cross-elasticity of demand, must be regarded as plain error.

2. *The "Acts" of IBM.*

If it be assumed that IBM had monopoly power during the period under consideration, which we do not decide, but the trial court so found, and further, that this position had been lawfully attained, also as the trial court found, were the changes in marketing methods under such conditions made by IBM lawful? The trial court found they were not. These changes were price reductions and leasing of equipment under fixed term leases and extended term leases.

The fixed term leasing will be first considered and excerpts from the Findings of Fact and Conclusion made by the trial court will be used in part to describe the leases and their use.

IBM announced a new marketing plan in May 1971. This was the leasing of peripheral units, not central processing units, for a fixed term of years rather than on its old lease which permitted the

user to cancel on thirty days' notice. Comparable "Extended Term Leases" were instituted thereafter.

Of the economic conditions existing at the time, the trial court found:

> "F89a. In 1970 and 1971 IBM experienced the effects of a nationwide recession combined with inflation, which caused a substantial increase in the level of returns and discontinuance of its EDP equipment including peripheral equipment. IBM at that time offered equipment only on short-term leases or for sale; its rental customers could effectively return their equipment to IBM on 30 days' notice. As a result of the economy, many of IBM's rental customers took advantage of this privilege and returned a significant amount of equipment to IBM. IBM's experience was not shared by its leasing company, systems manufacturer or peripheral equipment manufacturer competitors, since their equipment was generally leased for terms of one, two or more years, with termination charges or other costs in the event of cancellation. Another factor affecting IBM's business in this period was the increasingly lower rental prices charged by leasing companies and peripheral equipment manufacturers for equipment similar to IBM's. As a consequence of these factors, IBM's sales force in 1970 achieved only 50% of its selling objective. In 1971, IBM experienced the worst sales record year in its history for EDP equipment."

Also part of F86:

> "In view of the fact that most of IBM's systems manufacturer, leasing company and peripheral equipment manufacturer competitors were offering long term leases by the Spring of 1971 (Finding F100), IBM expected to, and was likely to, continue to lose substantial systems and peripheral business unless some plan was adopted."

The court continued in a conclusion:

> "C29. Agreements reached under IBM's fixed term and extended term plans are commonplace commercial agreements fixing the terms and conditions upon which users may lease some equipment for periods of up to two years. The terms of these leases are limited to provisions governing the use of the particular equipment under lease. They impose in and of themselves no restraints on the freedom of the lessee to trade. They do not obligate the lessee to any exclusive dealing arrangement. They do not obligate the lessee to purchase its requirements of the electronic data processing equipment, supplies or services from IBM. The term of leases contain no 'restraints' of the kind traditionally found violative of Section 1 of the Sherman Act. The terms of the leases are shorter than leases which had been offered by IBM's competitors, including plaintiffs, for some time prior to IBM's adoption of the fixed term and extended term plan. In a different context, the court in United States v. United Shoe Machinery Corp., 110 F.Supp. 295 at 297 (D.Mass.1953), aff'd per curiam, 347 U.S. 521, 74 S.Ct. 699, 98 L.Ed. 910 (1954), *supra*, expressly sanctioned the use of five year term leases despite its conclusion that defendant had monopolized the market for shoe machinery. The court concludes that the leases offered by IBM pursuant to the fixed term and extended term plans are not contracts in restraint of trade violative of Section 1 of the Sherman Act."

The trial court at the end of its conclusion C28 said:

> "I have concluded that the leases in question would not be unlawful without the monopoly power held possessed by IBM or the found attempt to monopolize."

As part of F88 the trial court said:

> "Again, there seems little question but that in a different context, or directed to general competition, the leasing plans adopted by IBM might be unexceptional or entirely justified. The question remains, however, whether in the setting of IBM's dominant position in the plug compatible submarkets and in view of the evidence as to its specifically directed intent and concern with reference to the plug compatible competition in those markets, the two leasing plans above-mentioned can be sustained as against Telex's attack."

The trial court concluded (C29) that the leases were "commonplace commercial agreements," as above noted, and when the leases were announced, most of the competition had similar leases in effect. Thus the customers had the choice of a lease, rental arrangement, or purchase.

IBM's one and two year leases contained a provision that they could be terminated by the lessee before the end of the term upon payment of a specified amount. Thus if a two year lease was ended during the first year, the charge was equal to five months' rental. A charge of two and one-half months' rent was provided for the termination of a one year lease before the end of the term or of a two year lease during the second year. These provisions applied uniformly and regardless of the reason for termination including the substitution of equipment. The leases offered by the competition of IBM also contained provisions for payment in the event the lessee terminated. Also some did not provide for termination by the lessee. (F100 and C29).

The trial court made no finding, and no evidence was introduced, as to whether the termination charges represented actual damages IBM would incur upon such a lease termination or whether they were more or were less. Thus no evidence exists to show whether the charges were excessive or not.

The trial court found that the leasing of equipment by or the change to a leasing plan was a violation of the Sherman Act. The trial court refers to the Fixed Term Leasing Plan as "FTP." Of this leasing plan, the court found (F96):

> ". . . Defendant's officers at the trial expressed the view that FTP was simply to render the company 'more competitive' and to obtain more business by meeting the competitive efforts on a basis similar to that of plug compatible suppliers. It is the court's view that such justification, which could be convincing under different circumstances, is overpowered by IBM's monopoly position in the particular markets involved and the rather clear indication that its action was directed not at competition in an appropriate competitive sense but at competitors and their viability as such. The products specified by FTP were those peripheral products on which IBM was receiving, or on which it anticipated that it would receive, substantial plug compatible competition."

The court again found some justification for the fixed term plan, but concluded it was illegal. It found in F100:

> ". . . By 1971, most of IBM's competitors, including systems and peripheral competitors and leasing companies, were offering users long term lease options. IBM's studies indicated that a long term lease plan on peripheral products, among other things, would reduce IBM's costs through decrease in 'churning' of IBM's leased equipment at the same time and for similar reasons that its competitive position in relation to PCM's would be enhanced. But preponderant evidence demonstrates that IBM's fixed term plan was generated and implemented at the time it was with the primary intent and purpose of suppressing plug compatible competition and to maintain its monopoly power in the plug compatible disk, tape and printer markets and the general plug compatible market for peripheral devices."

The leasing plans for peripheral units were only part of the way in which IBM reacted to conditions in the market in 1970. IBM made several studies of its market position. and how it could be improved. Price reductions were announced, and price reductions were also effected in the leasing plans. The pricing changes, and some model changes, came about after IBM management had made detailed study of the peripheral market and of its competitors in this market.

The trial court gave considerable attention to the reaction of IBM management in 1970 to the poor sales record of the company for peripheral equipment. These reactions were initiated by the creation of an executive group to study and report on the problem. The record indicates that this was the customary way in which

IBM handled serious corporate problems. Thus in 1970 a task force, called the Cooley Task Force, was appointed to study the plug compatible market and to recommend plans to improve IBM's position. This group directed its attention to the products, financial conditions, management, and general viability of its competitors in this market, including Telex. These studies were in some considerable detail.

The trial court in Finding 74 said:

> "F74. After the designation of peripherals as KCSI, a task force was formed in March of 1970 to be headed by H. E. Cooley, Vice President of the Systems Development Division. The Peripheral Task Force, or Cooley Task Force, as it became known, met regularly both in formal and informal meetings from the middle of March of 1970 until its report to the Management Committee of IBM on July 31, 1970. The objective of this task force was to examine the competitive threat to IBM of plug compatible suppliers. A Telex trial witness, Richard Whitcomb, who was IBM's manager of I/O Systems Marketing from the fall of 1968 to the summer of 1971, participated in the work of the Peripheral or Cooley Task Force on behalf of the Data Processing Division. A purpose of the Peripheral Task Force was to study and recommend plans and product strategies to impede the growth of IBM's plug compatible competition. The Peripheral Task Force made in-depth analyses of various plans and strategies each having as a significant purpose the containment and retardation of the growth of IBM plug compatible competitors. The task force made in-depth assessments of the status of plug compatible competition and analyzed the viability of particular plug compatible competitors, including Telex."

The first corporate action taken thereafter by IBM to carry out the task force recommendations was a repricing and rearrangement of its disk storage device. The disk drive peripheral units of the competition had made serious inroads on IBM's disk drives. The

model announced by IBM was 2319A and was a reworked, rearranged version of units previously marketed, and the results achieved were essentially the same as those by the prior units. This 2319A unit used basic components which were available and returned by users. The rental announced for the 2319A was below that charged on the prior units, and was below the Telex price.

The trial court found:

> ". . . IBM's price cuts for the 2319A and IFA were not justified upon the basis of reduced manufacturing costs.
>
> "F78. IBM may have reduced its cost somewhat through reuse of 2314's which were being returned to IBM because of plug compatible competition, but it is clear from the evidence that any decreased cost was of minor importance or influence in the Mallard plan and that price reduction independent of cost on limited products in competition with plug compatible suppliers was the primary purpose of the response . . .
>
> "F79. The 2319A price cut was designed by IBM specifically to contain plug compatible competition. It originated in the Cooley or Peripheral Task Force and was approved by top management. Its primary purpose was to maintain control of the plug compatible disk market for IBM. It was introduced by IBM with the specific purpose and intent of suppressing plug compatible disk competition. IBM admits, indeed argues, that its action was a competitive response necessitated by the inroads of plug compatible competition and that it in fact did not succeed in maintaining IBM's market share. But IBM already possessed a dominant market share, and continues to do so. Notwithstanding lawful acquisition theretofore, its intent to maintain its monopoly by unlawful predatory conduct cannot be equated reasonably with an ordinary competitive response."

The reaction of IBM, and the use of studies of competition continued. As the trial court found:

"F80. IBM, in October, 1970, organized a second peripheral task force to analyze plug compatible competitors in the disk drive area. The scope of the task force study included analyzing of the marketing, management, maintenance, production and engineering capability of IBM's plug compatible competitors. The group was directed to study and estimate the announcement and first customer shipment dates on PCM's 3330 equivalents and make a cash flow analysis, including financing arrangements, of PCM's, to make an estimate of the PCM's 2314 manufacturing cost and to determine 'how long can OEM PC suppliers go on 2314 prices?' This group's report concerning Telex concluded that Telex was viable, that its management was competent and aggressive and that it had a strategy of marketing a full line of high volume IBM plug compatible peripherals, that its in-house engineering capability was good, but that its manufacturing costs were 10% to 15% above IBM's. The Telex analysis concluded that Telex's cash flow was inadequate to permit Telex to finance its own lease base and that Telex's key exposure was 'impact by IBM—shortens product life.' "

IBM made studies of the impact on Telex and Memorex of price reductions of disk drives. The management was contemplating a reduction in prices of such units to be used with another type of its central units. The studies indicated that the reduction would cause a price cut by the two competitors and would have a "very serious impact" on their profits and revenues.

The 2319B project with a rearrangement and repackaging was announced in December 1970 with price reductions. The trial court found that the 2319B announcement "was purely a price cut to a point below the prices charged by competitors including Telex." The trial court also found (F84):

"The 2319B was designed by IBM as a predatory action contrived to maintain its 94% control of the plug compatible disk market."

IBM further reduced the cost to users by an elimination of extra use charges on all its disk storage devices.

The 2319B reductions were followed by price reductions by Telex and others. However, Telex negotiated a 28 per cent price reduction from its supplier for the comparable units. The court found (F86):

"After the decrease in Telex disk device prices, the order rate of Telex disk devices again increased significantly."

Telex in the following period shipped more units than it had forecasted it would.

The court, in F89, found:

"IBM's 2319B announcement failed to retain IBM's high share of the plug compatible disk market and failed to contain the growth of IBM's plug compatible competition during the first quarter of 1971. The latter continued to make strong advances with its installation in the 2314 disk drive area."

The court also found that the strength of this competition was spreading to other compatible devices than disk drives.

The memory devices underwent a substantial technical change during the period in issue. There were also price reduction on the memory units, and the combination of the units with the CPU's in one "box." The older memory unit was a magnetic core unit and the new one based on a different principle was called a FET.

IBM had a group organized to plan the strategy for pricing and marketing the FET. The court found that the purpose of the task force was to prevent entry into the market by the competition. The court found (parts of F108 and F107):

"F108. . . . The work of this memory task force included an attempt to fix a price for IBM's monolithic FET memories that would influence potential plug compatible competitors to stay out of the market. The IBM Manage-

ment Review Committee set the monthly rental price for IBM's FET monolithic memory at $5,200 per month per megabyte, which was less than the amount reporting experts had indicated a potential competitor would be required to charge in order to enter the market and be profitable and viable." [The trial court is in error on this point as it has confused the pricing of the old memory device with the FET device. The $5,200 figure rental price the court mentioned was for the older memory device and not the FET.]

"F107. While cost and performance juistifications may have existed to an extent, it is found that IBM lowered the price on its FET monolithic memory products and raised prices on its CPU with the primary purpose of creating barriers to entry for potential plug compatible memory competitors. . . ."

The court also found in F108 (part):

". . . Neither the design of the 370/158 and 370/168 nor the price of $5,200 per megabyte per month prevented Telex from planning competing memory products and in March, 1973, it announced that it would market memory components for 158 and 168 systems. Control Data, Itel, Ampex and Intel have announced memories for IBM's 370/158 and 370/168 systems at prices substantially below IBM's price."

IBM had announced a new memory device based on new technology in August 1972, the FET. This was an entirely new product and management set the price on it. It was incorporated as a part of several new central processing units then being marketed. The unit was some thirty to fifty times smaller than the unit based on different principles theretofore developed for essentially the same purposes. The new unit was also much less expensive, about one-half, as the former unit. In Finding 111 the trial court said of the new type memory unit that performance and cost improvements came about by its smaller size. There was no question but that the FET was a new technological development. The trial

court (F110) also found that the pricing of the new device was such that it would return a reasonable profit.

The trial court found that four other makers of peripheral products had announced similar memory devices, copies of IBM's, at prices well below the IBM price. The plaintiff indicated it would also market a copy.

The Fixed Term Plan Leases of IBM on peripheral products announced in May 1971 provided an 8 per cent discount in monthly rental for one-year leases and a 16 per cent discount on two-year leases. IBM also eliminated the extra use charge on equipment under such leases. The elimination of the extra use charges resulted in a significant total reduction in costs to the customer.

The trial court found, referring to all price reductions, that "the price cuts in some instances put IBM prices below those of its plug compatible competitors."

As to the pricing by IBM, the court found:

"F111a. There was no evidence that IBM reduced prices below cost and a reasonable profit. Indeed, when announced the profitability of the 2319 disk storage units, the 370/158 and 168 CPU's and CPU memory elements were anticipated to be in excess of 20%. Likewise, at the announcement of FTP it was anticipated that the profitability of the products to which it applied would be at least 20%. Those profit margins in part, of course, would have been achieved by obtaining leases of products which would have otherwise been made by Telex and other PCM's. Those price reductions are found to be predatory."

The fixed term leasing plan of IBM did not cover central processing units. During the price reductions on peripheral units, IBM increased slightly the charges on its central processing units and on such units including 360 memories. The record shows that the central units on which prices were raised were the result of considerable development costs, had improvements incorporated in

them, and contained a larger number of parts newly designed. There is no indication that the increase was not reasonable and the trial court did not find it to be otherwise. These prices are within the general finding of reasonable prices. However, the trial court found the increase to have been made to offset the reduction in prices of the peripherals.

The following finding of the trial court quoted in part sums up the position it took as to the leasing and pricing. It also demonstrates the emphasis the court placed on the IBM task force studies of competition, and the source of the "predatory" appellation it used:

> "F112. IBM's growth and success in the industry have been due in substantial measure to its skill, industry and foresight. It has tended to set the standard for quality in the EDP industry for products and services. . . .
>
> ". . . I therefore cannot fully agree with Telex's contention that 'IBM did not gain, nor has it maintained its position in the industry through skill, industry and foresight.' No doubt it gained a dominant position in the industry through a praiseworthy degree of these qualities. Whether there was anticompetitive conduct that went along with them in recent years prior to 1969, the record does not disclose. The real problem here is notwithstanding this, whether IBM has maintained its monopoly position, or attempted to do so, by unlawful conduct since 1969. In the respects determined here in the critical period at least it must be recognized that its diligence and foresight have included the competitive studies and the anticompetitive objectives and intent heretofore found, and that particularly as applied to this case have included an attempt to substantially constrain or destroy its plug compatible peripheral competition by predatory pricing actions and by market strategy bearing no relationship to technological skill, industry, appropriate foresight or customer benefit. . . ."

The Trial Court's Application of the Law:

The trial court, to the "acts" of IBM described above, applied

a standard it derived from a group of cases it relied upon and quoted from. Its view was summarized in Conclusion 6 which in part is as follows:

> "C6. I believe the applicable rule to be that monopolization in violation of Section 2 of the Sherman Act involves two elements: (1) The possession of monopoly power in the relevant market or submarket and (2) the willful acquisition or maintenance of that power with intent to monopolize, which intent need not be evidenced by predatory practices but which is not to be gathered merely from growth or development as a consequence of a superior product. (Citations omitted)."

The trial court thus took the position in the Conclusion referred to that the cases hold that a market practice or pricing under consideration in these circumstances is improper if it is not a consequence of historic accident, business acumen, or a superior product. In Conclusion 17, the trial court, as to the showing of intent, also said:

> "It is sufficient that monopoly power is willfully acquired or maintained as distinct from the growth or development as a consequence of a superior product, business acumen or historic accident."

The trial court held that the acts of IBM could not be placed in any of the three exceptions and thus they were illegal. This view of the authorities taken by the trial court is an extremely narrow one, and ignores two factors. The first factor is whether or not the acts are ordinary business practices typical of those used in a competitive market, and secondly whether the acts constitute the *use* of monopoly power. Thus if a business attained a position of monopoly power by research and technical innovations, can it change to utilize the marketing devices already employed by others in the market, and can it reduce prices not below a point where they will derive a reasonable profit?

It is obvious that the reduction in prices by IBM resulted in price reductions by others in the market. These others had in the past priced below IBM as the record shows that Telex was the next below IBM in price levels and the others below Telex. The reduction was a disturbance in the price structure. As to Telex the record shows that it was able to secure substantial price reductions from its suppliers as to some items when this took place. The record also shows that IBM costs were greater than those of Telex and others in the market and the reasons therefor are obvious. After the price reductions by IBM, the trial court found it was nevertheless earning a "reasonable" profit (F95A also). The competition thus followed the IBM pricing, but this does not appear to be significant in view of the trial court's finding that IBM set the technical and quality standards, and was the leader in the development of new technology and products. After the initial price reaction with a signifiant loss of orders by Telex it within a relatively short time again recovered and began to increase its share of the market. The trial court so found (F89, F67, F116, F108). Better products and lower prices came about throughout the period under consideration.

The trial court did not find nor did it hold that the acts of IBM found to be illegal were derived from its power in the market or its size, nor were they acts which could only have been performed by one with the requisite power. The "acts" found by the trial court to be illegal were ordinary marketing methods available to all in the market. As to pricing, the trial court found it was used by IBM only to a limited extent, that is, within the "reasonable" range. The resulting prices were reasonable in that they yielded a reasonable profit. This "profit" the trial court found to be about 20 per cent. Thus there is no use of price reductions by an economic giant to drop prices to a level where it is not receiving an adequate return and must instead rely on its reserves or other activities to continue producing and marketing the particular product. Instead in the case before us, as demonstrated by the trial court's findings, the particular products of IBM here considered stood on their own feet as to financial returns. Furthermore it was also demonstrated that IBM's costs were above others in the market. From these facts it must be concluded that IBM did not *use* monopoly power even if it assumed that it possessed such power. The cases relied upon by the trial court all refer to the "use of monopoly power," and this is all the law condemns. Again under our assumption IBM gained its market position by technical advances and quality products. The record shows, during the period under consideration, that the parties and others in the market produced more advanced products better suited to the needs of the customers at lower prices.

Use of Monopoly Power:

The Court, in United States v. Griffith, 334 U.S. 100, considered circumstances where the defendant theater operators used their combined monopoly positions in certain towns to gain competitive advantages in other towns where they had no monopoly. The Court referred to the use of monopoly power:

> "The anti-trust laws are as much violated by the prevention of competition as by its destruction. It follows *a fortiori* that the use of monopoly power, however lawfully acquired, to foreclose competition, to gain a competitive advantage, or to destroy a competitor is unlawful."

This *use* of the power to control prices or to exclude competition (United States v. DuPont de Nemours & Co., 351 U.S. 377) was there considered to be the basis of the violation.

In United States v. Grinnell Corp., 384 U.S. 563, there was no issue as to the improper use of contracts and acquisitions both to attain and maintain a monopoly. The Court instead considered only the relevant market problem. In several other cases the "power" aspect is dominant, as evidenced by United States v. Swift & Co., 286 U.S. 106. There it was stated that size was not

enough alone, but gave rise to the opportunity for abuse as therein found. The Court thus held that Swift & Co. had used its size for "abuse." We have no finding by the trial court, nor does the record indicate, that this is such a "power" case, although there are several references to the size of IBM.

In American Tobacco Co. v. United States, 328 U.S. 781, the Court referred to the "thrust upon" monopoly power mentioned in United States v. Aluminum Co. of America, 148 F.2d 416 (2d Cir.); stated that such a situation did not exist in the case before it, and there was an actual conspiracy. The Court quotes certain passages from United States v. Aluminum Co. of America opinion relating to the exclusion of competition, and notes that there is no real difference between competitors who are put out of business or whether they are prevented from entering the market. These quotations also include references to the requirement under section 2 of the Sherman Act that there be the "power" to monopolize and the "intent" to monopolize. The *American Tobacco* opinion is thus not particularly helpful in this case except as to the acceptance of portions of the *Alcoa* opinion. The "thrust upon" category described in *Alcoa* was there mentioned, but not necessarily endorsed. It has elsewhere been generally recognized and the same or comparable language has been used. However, there is no detailed consideration of the meaning or scope of the several elements mentioned in the context of monopoly power lawfully acquired. The trial court did not do so here. It also held that there were no other exceptions than those mentioned in *Alcoa,* and no limited action whatever would be permitted outside them by way of ordinary business practices. The "thrust upon" exception has been more frequently used in reference to the attainment of a monopolistic position than in reference to what one with legitimately acquired monopoly power may do. The element of "business acumen" in the exceptions has not been defined. If the "thrust upon" exceptions are adopted,

they must be fitted in with the requirement that a "use" of monopoly power is required. It would be simple to place the "acts" here under consideration within the "business acumen" exception, but it is virtually unlimited. However, we do not accept the requirement that the only permitted exceptions, or that the "thrust upon" shorthand description means that the events or acts must be entirely involuntary. To do so would permit the defendant corporation to do nothing whatever by way of change in marketing. There must be some room to move for a defendant who sees his market share acquired by research and technical innovations being eroded by those who market copies of its products. It would seem that technical attainments were not intended to be inhibited or penalized by a construction of section 2 of the Sherman Act to prohibit the adoption of legal and ordinary marketing methods already used by others in the market, or to prohibit price changes which are within the "reasonable" range, up or down. Under the unusual market circumstances before us, to so interpret the Act to prohibit such actions is to protect the others in the market from ordinary competition, and was an incorrect interpretation of applicable law.

It is necessary to briefly consider the characterization of the above considered marketing changes as "predatory" by the trial court. The term probably does not have a well-defined meaning in the context it was used, but it certainly bears a sinister connotation.

The "predatory" conclusion was expressed after the trial court had given extended consideration to the creation of "task forces" by IBM, and the direction of their attention and study to Telex especially and other corporations in the business. The consequences of repricing and the pricing of new products upon competitors was also considered by the trial court to have legal consequences adverse to IBM. The record demonstrates that these acts of IBM are again part of the competitive scene in this volatile

business inhabited by aggressive, skillful businessmen seeking to market a product cheaper and better than that of their competitors. To do this, the record shows it was customary for them to study their competitors, all their capabilities, and what may be expected of them when a new product appears on the market. It is IBM's participation in this marketing that the trial court termed "predatory," but the record shows this was no more than engaging in the type of competition prevalent throughout the industry. It would not seem necessary to discuss this point at length as it is another manifestation of the conclusions the trial court derived from the "acts" which we have considered above. This aspect of the case is, for all practical purposes, governed by the opinion in Times-Picayune Pub. Co. v. United States, 345 U.S. 594. *See also* Travelers Insurance Co. v. Blue Cross, 481 F.2d 80 (3d Cir.), and Panotex Pipe Line Co. v. Phillips Petroleum Co., 457 F.2d 1279 (5th Cir.).

The "attempt to monopolize" aspect need not be separately considered.

3. IBM's Counterclaim.

In its answer to Telex's amended consolidated complaint IBM asserted two counterclaims. The first counterclaim was based on alleged misappropriation by Telex of IBM trade secrets. The second counterclaim was based on alleged copyright infringement by Telex of certain IBM manuals and publications. The judgment entered on the second counterclaim for copyright infringement is not involved in this appeal.

As concerns the first counterclaim, the trial court found that Telex had misappropriated IBM trade secrets and in connection therewith granted certain injunctive relief and also awarded compensatory damages in the sum of $20,900,000 and punitive damages in the sum of $1,000,000. The equitable relief granted in connection with the first counterclaim is not involved in this

appeal. What is challenged on appeal is the trial court's finding that there was a misappropriation of IBM trade secrets by Telex, and the trial court's award of $20,900,000 as compensatory damages, plus an additional $1,000,000 as punitive damages. Telex's basic approach is that there was no misappropriation of any trade secret belonging to IBM, and that, in any event, the trial court's award of damages was excessive and not supported by the record.

In the recent case of Kodekey Electronics, Inc. v. Mechanex Corp., 486 F.2d 449 (10th Cir. 1973), we hewed to the oft-repeated statement, found in the Restatement of the Law of Torts, § 757, Comment b, that a trade secret consists of any formula, patent, device, plan, or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know it. In that case we also noted that generally just what constitutes a trade secret under the above definition is a question of fact for the trial court. Let us briefly examine the trial court's findings regarding misappropriation of trade secrets. In this regard, of course no one testified that he "saw" Telex misappropriating IBM's trade secrets, nor did any quondam IBM employee admit that he had taken IBM's trade secrets with him to Telex. But, in our view, the facts and circumstances, when viewed in their totality, do permit the inference that there was such misappropriation.

The heart of the trial court's findings on the issue of misappropriation is that Telex lured key employees away from IBM with the promise of greatly increased salaries, plus substantial bonuses, and that these quondam IBM employees brought with them IBM trade secrets which enabled Telex to market plug compatibles sooner than it would have otherwise been able to by waiting till IBM equipment hit the open market and by then duplicating the same through reverse engineering. It was this "head start" or

"lead time" that placed Telex in a better economic position because of its misappropriation of IBM trade secrets. Specifically, the trial court found that the hiring of the IBM employees James, Gruver and Clemens, and the utilization of the trade secrets which each brought with him to Telex, enabled Telex to hit the market sooner than it would have otherwise been able to with Telex's version of the Aspen tape controller, and at the same time substantially advanced Telex's work related to a duplication of IBM's Merlin disc controller. The latter project was apparently terminated by Telex before completion.

We do not here propose to summarize all of the trial court's findings on the matter of misappropriation of trade secrets, or to detail the supportive evidence for such findings. As indicated, the trial court made elaborate findings on all phases of this case, and its findings on the counterclaim are numbered 132 to 168, and appear at pages 313 to 328 in its opinion, which in turn appears at 367 F.Supp. 258. These findings speak eloquently for themselves, and it is sufficient here to simply state that our study of the record indicates that the trial court's findings of fact are amply supported by the record.

Furthermore, the trial court's conclusions of law clearly indicate to us that the trial court did not misapply the law on the subject. As concerns the trial court's legal conclusion, we refer to the conclusions numbered 44 and 45, which read as follows:

> "The facts here go beyond the mere termination of employment and the acceptance of employment from a competitor; disclosures to employers of information acquired during the course of previous employment which was a matter of general knowledge or information as it might be retained in memory; the utilization of skills, expertise and general technical and business information learned in former employment; the employment of 'key' employees of a former employer to obtain skills and knowledge in the usual course of business; the obtaining or disclosure of data not confidential or which do not constitute trade secrets reasonably

> protected by others; information disclosed by the products marketed; the disclosure of information that could not be considered to have been 'discovered'; the disclosure of information readily available from other sources; or matters which are generally known in the trade or readily discernible by those skilled in the trade, and such circumstances.
>
> "The trade secrets or confidential information found here clearly fall within the definition of formula, patterns, business plans, compilations of information or technical knowledge which were used in IBM's business, which were important in that business, which were treated and sought to be protected as confidential to IBM for the purposes of its business, and which entitled IBM legitimately, by reason of its exceptional diligence, technology and discovery to obtain legitimate competitive advantage over competitors not possessing such knowledge or information and not able, legitimately and within a reasonable time frame, to obtain it otherwise, Telex obtained these trade secrets from IBM by a massive and persuasive program designed to induce the breach of known obligations of IBM employees or former employees. That such information or part of it could have been subsequently procured by Telex, given enough time and expense, by independent investigation, research or experience, did not justify Telex' conduct. That subsequent to the invasion of IBM's trade secrets a portion of the information in the course of marketing of IBM products became available to the public, including Telex, did not excuse Telex's conduct in the first instance nor insulate it from liability to both monetary and equitable relief. . . ."

In support of the foregoing conclusions, see the numerous cases and authorities cited on page 358 of the trial court's opinion. In sum, then, the trial court's holding that Telex misappropriated IBM trade secrets finds support in the record and is in accord with the applicable law on the subject. Before leaving this point, two related matters deserve brief comment.

Telex alternatively suggests that even if there be a misappropriation of trade secrets, IBM is barred from any recovery

by the unclean hands doctrine. In this regard Telex asserts that the antitrust violations on the part of IBM preclude recovery for any possible misappropriation of trade secrets. Our resolution of Telex's claims for alleged antitrust violation has rendered this argument unavailing.

Also, Telex argues that federal patent laws so preempt the field that state trade secret laws are abated whether the trade secret in question be patented, patentable or unpatentable, citing in support of such proposition Kewanee Oil Co. v. Bicron Corp., 478 F.2d 1074 (6th Cir. 1973). This line of argument is now untenable under Kewanee Oil Co. v. Bicron Corp., ... U.S. ..... (1974), wherein the Supreme Court reversed the case relied on by Telex. Let us now turn to the matter of damages.

As above mentioned, the trial court awarded IBM the sum of $20,900,000 as compensatory damages. This sum is broken down as follows: (1) $7,500,000 as damages sustained by IBM in connection with its Aspen tape system; (2) $10,000,000 as damages sustained by IBM in connection with its Merlin disc system; (3) $3,000,000 as damages for increased plant security measures put into effect by IBM as a result of Telex's efforts to appropriate IBM trade secrets; and (4) $400,000 as additional expense incurred by IBM for work performed by IBM in its own plant, which work would otherwise have been farmed out at a lesser cost, but was not farmed out because of the fear by IBM that in so doing trade secrets would somehow be "leaked" to outsiders, including Telex. The sum of these four items equals $20,900,000, the amount awarded IBM by the trial court as compensatory damages.

The IBM counterclaim being based on misappropriation of trade secrets, the measure of damages is governed by Oklahoma law. However, our attention has not been directed to any Oklahoma authority which is particularly helpful, and in such circumstances we resort to the general law on the subject. And unfortunately the genral law as to the proper measure of damages in a trade secrets case is far from uniform. Four cases will perhaps illustrate the varying approaches to this problem.

In International Industries v. Warren Petroleum Corp., 248 F.2d 696 (3d Cir. 1957), the Third Circuit declared that by analogy to patent infringement, the proper measure of damages in a misappropriation of trade secrets case "is not what the plaintiff lost, but rather the benefits, profits or advantage gained by defendant in use of the trade secret." In assessing the "benefit" accruing to the misappropriator of trade secrets, that court applied the so-called "standard of comparison" test. That test contemplates a comparison of the costs incurred by the defendant using the stolen trade secret, and the costs that would have been incurred had he not used the trade secret. The difference between the two is the "benefit" accruing to the defendant, and is the measure of plaintiff's damages.

Somewhat in line with the foregoing is Gordon Form Lathe Co. v. Ford Motor Co., 133 F.2d 487 (6th Cir. 1943). That was a patent infringement case but, as was above mentioned, courts have indicated that trade secrets cases are analogous to patent infringement as concerns measure of damages. In *Gordon Form Lathe Co.*, the court held that the correct measure of damages is the "advantage" accruing to the infringer, namely, the "savings" which the infringer derived from using the plaintiff's patent, which saving constitutes "profit" which the plaintiff, the patent holder, was entitled to recover.

However, in Sperry Rand Corp., v. A-T-O, Inc., 447 F.2d 1387 (4th Cir. 1971), the Fourth Circuit indicated that perhaps "loss" to the plaintiff, rather than "benefit" to the defendant, was the better measure of damages in a misappropriation of trade secrets case. In this regard that court commented as follows:

> ". . . There are two basic methods of assessing damages for misappropriation of trade secrets: One, the damages sus-

tained by the victim (the traditional common law remedy), and the other, the profits earned by the wrongdoer by the use of misappropriated material (an equitable remedy which treats the wrongdoer as trustee *ex maleficio* for the victim of the wrongdoer's gains from his wrongdoing). R. Ellis, Trade Secrets § 286 (1953); Restatement of the law of Torts §§ 746 and 747 (1938); R. Callman, The Law of Unfair Competition, Trademarks and Monopolies § 59.3 (1965). Ordinarily a plaintiff may recover either, but not both, because to allow both would permit double recovery. Ellis, *supra,* § 287; Restatement, *supra,* § 747(c); Harley & Lund Corp. v. Murray Rubber Co., 31 F.2d 932 (2d Cir. 1929), cert. den., 279 U.S. 872, 49 S.Ct. 513, 73 L.Ed. 1007 (1929); Consolidated Boiler Corp. v. Bogue Elec. Co., 141 N.J.Eq. 550, 58 A.2d 759 (1949). Since the objective in allowing damages is to compensate the plaintiff for the difference in his position before and after the misappropriation of his secret, his probable loss may be the more significant measuring rod than the misappropriator's actual gain. Callman, *supra,* § 59.3 at 497. . . ."

In Clark v. Bunker, 453 F.2d 1006 (9th Cir. 1972), the Ninth Circuit indicated that the measure of damages for wilful misappropriation of a trade secret was not limited to the misappropriator's profits, and that the plaintiff there was also entitled to his "loss," which in that case was not in any manner related to the benefit accruing to the misappropriator. That court commented that since the unification of law and equity, the proper measure of damages was no longer an "either or" matter, i.e., damages limited to *either* plaintiff's loss, *or* defendant's benefit, and that it could be a combination of both where the circumstances called for such in order to make the plaintiff whole. And perhaps that is a common thread in all of these cases, i.e., the plaintiff should be made whole, and, at the same time, there should be no double recovery. Let us examine the damages awarded in the instant case against this backdrop of cases.

As previously mentioned, the trial court awarded IBM the sum of $7,500,000 as damages sustained in connection with the Aspen project. Of this amount $4,500,000 represented monthly rentals lost by IBM as a result of Telex's misappropriation of trade secrets which enabled Telex to get its product on the market sooner than would otherwise have been the case. In other words, through the use of these trade secrets, Telex was able to market its peripheral units much sooner than if it had waited for the IBM product to be marketed, and then have duplicated it through reverse engineering. The net result was that because of its misappropriation of trade secrets Telex products displaced IBM products in the rental market sooner than would otherwise have been the case, resulting in a loss of rentals to IBM. In this regard the trial court first determined the total number of rental months lost by IBM, and then the average monthly rental price, and in this manner arrived at the loss incurred by IBM when its machines were displaced by Telex products, which rented at a lower figure. We find no error in the award of this sum, which represents a direct loss of income to IBM. There is some suggestion that this item should be limited to the "net profit" which IBM would have realized from the continued rental of its products. The record indicates, however, that IBM lost the entire monthly rental when its products were displaced by Telex products. In sum, this item of damage is in our view proper, and finds support in the record.

The trial court also allowed IBM an additional $3,000,000 as further damage sustained by it in connection with the Aspen project. Some of the Telex products directly and immediately displaced IBM rental units. However, Telex also marketed its products to others who had not themselves done business with IBM. The trial court was of the view that IBM should be recouped for the profit realized by Telex in connection with the marketing of its products to persons other than those who had been using IBM products, and attempted to do so by determining

the extent to which Telex had been unjustly enriched. In arriving at this award the trial court first found that IBM had expended $10,000,000 on the development of the Aspen project from the the start of the program till the date of the first customer shipment, and that Gruver and others left IBM half way through the development program, taking with them a substantial part of the information developed through the first half of the program at the cost of $5,000,000. The trial court then recognized the "standard of comparison" test referred to in International Industries v. Warren Petroleum Corp., *supra,* and attempted to ascertain the unjust enrichment accruing to Telex through savings, separate and apart from the specifically proven lost rentals. For this reason it scaled down the $5,000,000, which was the total unjust enrichment accruing to Telex, to $3,000,000, and awarded IBM that sum, in addition to the earlier award of $4,500,000. We think such was proper and is not a form of double recovery. Not to have allowed such would have been a denial to IBM of a substantial portion of the damage sustained by it in connection with the Aspen project. In sum, we are not inclined to disturb the award of the trial court of $7,500,000 in connection with the Aspen project.

In connection with the Merlin project, the trial court awarded IBM the sum of $10,000,000. This sum, according to the trial court, represented a saving to Telex which resulted in an unjust enrichment. In other words, if Telex had not misappropriated and used IBM trade secrets, it would have itself spent $10,000,000 more than it did in connection with the work on its equivalent of the Merlin disc. The trial court found that IBM had itself expended $30,000,000 to develop the Merlin, and that it took six years to do so. Telex, on the other hand, through the use of IBM trade secrets was able to develop its equivalent in some eighteen months. We recognize, as did the trial court, that Telex did not complete its Merlin project. Nevertheless, the trial court

was of the view that Telex had saved itself $10,000,000 in its Merlin development and that it was unjustly enriched in that amount. We agree.

As was recognized in Gordon Form Lathe Co. v. Ford Motor Co., *supra,* in a proceeding such as this one, damages can seldom be proven with mathematical certainty, "nor anything approaching it, but we should reach the degree of likelihood on which reasonable men are content to act in the everyday concerns of business life." We conclude that the award of the trial court of damages for $7,500,000 in connection with the Aspen project and $10,000,000 in connection with the Merlin project are not speculative, and, while such may not have been established with mathematical precision, they do meet the "degree of likelihood" test. The fact that such damages may be difficult to pin down should not militate in favor of the wrongdoer.

The trial court also awarded IBM the sum of $3,000,000 for "increased extraordinary security costs reasonably occasioned by Telex's unlawful activities," the trial court observing that such figure was a "fair approximation" and a "nonspeculative" minimum amount. In our view, however, this particular item is speculative and cannot be sustained. The reasoning of the court was that this stepped-up plant security on the part of IBM, consisting of additional guards, television cameras, sensors, locks, safes, computer-controlled access system, and the like, was occasioned by the fact that Telex was luring IBM's employees away from IBM by the offer of substantial salary increases, and bonuses. This item of damage might well under different circumstances be proper. But here we fail to perceive how the increased security costs were the proximate result of Telex's hiring of IBM's employees. Telex was not climbing fences or breaking down doors in its appropriation of IBM trade secrets. Telex's methods were more subtle, involving the luring of IBM employees who brought with them the trade secrets in question. In any event, we fail to see how this

particular $3,000,000 figure is attributable to Telex and it is too tenuous to be permitted to stand.

Finally, as concerns compensatory damage, the trial court awarded IBM the sum of $400,000 for the increased cost of manufacturing the Merlin head arm within IBM. We fail to see how this management decision on the part of IBM to perform certain work within its own plant, rather than farming out the work, can be attributable to the fact that Telex was stealing IBM employees. This item of damage is also far to speculative to be permitted to stand.

The trial court awarded the sum of $1,000,000 as punitive damages. In this regard Telex in its brief concedes that punitive damages are generally a matter of discretion with the trial court, and, under all of the circumstances, we find no abuse of discretion by the trial court in its assessment of punitive damages. Indeed, in view of what we deem to be rather flagrant conduct on the part of Telex, the trial court exhibited considerable restraint in its award of punitive damages.

Accordingly, as concerns the IBM counterclaim, the trial court's award of compensatory damages is reduced to $17,500,000, and the judgment as thus reduced, including the award of $1,000,000 as punitive damages, is affirmed.

VIII.

DISPOSITION OF THE CASE.

The judgment of the trial court against IBM must be reversed because it is based upon an erroneous determination of a fundamental element in the case. This element is the "market" as the term is used in the antitrust laws, and in which the competition, the market shares, the acts, and the identity of the competitors may be evaluated and compared. The trial court's definition of this "market" was in error as described above.

The judgment against IBM must also be reversed because, as stated above, the findings of fact as to the "acts" of IBM made by the trial court when evaluated under the Sherman Act and when set in the context of the prevailing court opinions do not constitute a violation of law.

The judgment of the trial court against Telex on the counterclaim of IBM for the misappropriation of trade secrets, the property of IBM, is reduced to $17,500,000, as compensatory damages, and is so affirmed. The award of punitive damages to IBM on the same counterclaim in the amount of $1,000,000 is affirmed.

The judgment insofar as it awards attorney fees and costs is set aside, and that matter is remanded to the trial court for further consideration. The parties in this court shall each bear their costs and attorney fees.

The case is so reversed, and is remanded for entry of judgment for defendant on the complaint, for consideration of trial costs and trial attorney fees, and for entry of judgment for IBM on its counterclaim as above provided.*

*Each member of the panel named above collaborated fully in the preparation and writing of the within opinion.

Appendix D

[Endorsed]
FILED
Jan 24, 1975

United States Court of Appeals
TENTH CIRCUIT

Nos. 1874, 1875, 1876, 1877, 1878,
1961, 1962

THE TELEX CORPORATION, and TELEX COMPUTER PRODUCTS, INC.,
Plaintiffs-Appellees-Appellants (and Appellants on Counterclaim),

v.

INTERNATIONAL BUSINESS MACHINES CORPORATION,
Defendant-Appellant-Appellee (and Cross-Appellant on Counterclaim).

Appeal from the United States District Court
for the Northern District of Oklahoma
(D.C. Nos. 72-C-18, 72-C-89)

Before SETH, McWILLIAMS and DOYLE, Circuit Judges.

PER CURIAM

ORDER

The judgment of the trial court in favor of Telex Corporation and Telex Computer Products, Inc. and against IBM must be and the same is hereby reversed for reasons fully set forth in the court's opinion which will follow. In brief summary, the court does hereby:

Reverse that part of the judgment of the trial court which entered money judgment against IBM. This reversal is based on this court's determination that the trial court erred in defining relevant market or market as the term is used in the antitrust laws and within the scope of which the framework of competition, the market shares, the acts and the identity of the competitors may be evaluated and compared. This fundamental misconception affected the remainder of the court's decision.

Secondly, the judgment against IBM is reversed because of the trial court's findings of fact as to the acts of IBM and the court's determination that these acts were predatory and contrary to the Sherman Antitrust Act. The evidence establishes that IBM's actions constituted valid competitive practice and were neither predatory nor otherwise violative of the antitrust acts.

The judgment of the trial court against Telex based on the counterclaim of IBM which finds that Telex had misappropriated and pirated trade secrets of IBM is supported by the evidence and law and affirmed as to the liability of Telex. The damage award is reduced to $17,500,000 compensatory damages; the judgment in the amount of $1,000,000 punitive is affirmed. As modified, this judgment on the counterclaim is affirmed.

We do hereby vacate the trial court's awards of attorney fees and costs. On remand the trial court is directed to reconsider its awards of costs and attorney fees in the light of the action taken in this court. The parties are directed to bear their own costs and attorney fees incurred in this appeal.

The judgment, as fully expessed in our opinion, is reversed and remanded to the district court with directions to enter judgment in favor of IBM on the Telex complaint and for award of costs and attorney fees at the trial and for the modification of judgment in favor of IBM on its counterclaim as above provided.

The opinion of the court will be filed in the next several days.

JANUARY TERM—JANUARY 24, 1975

Before The Honorable Oliver Seth, The Honorable Robert H. McWilliams and The Honorable William E. Doyle, Circuit Judges

Nos. 73-1874, 73-1875, 73-1876, 73-1877,
73-1878, 73-1961 and 73-1962

THE TELEX CORPORATION, and TELEX COMPUTER PRODUCTS, INC.

Plaintiffs-Appellees-Appellants (and Appellants on Counterclaim),

vs.

INTERNATIONAL BUSINESS MACHINES CORPORATION,

Defendant-Appellant-Appellee (and Cross-Appellant on Counterclaim)

(D.C. Nos. 72-C-18, 72-C-89)

This cause came on to be heard on the record on appeal from the United States District Court for the Northern District of Oklahoma, and was argued by counsel.

Upon consideration whereof, it is ordered that the judgment of said court is affirmed in part and reversed in part as follows:

(1) The judgment of the trial court which entered a money judgment against I.B.M. is reversed.

(2) The trial court's judgment finding and determining that the acts of I.B.M. were predatory and contrary to the Sherman Antitrust Act is reversed.

(3) The judgment of the trial court against Telex on the counter claim is affirmed as to the liability of Telex. The damage award is reduced to $17,500,000 compensatory damages; the judgment in the amount of $1,000,000 punitive is affirmed. As modified, this judgment on the counterclaim is affirmed. The judgment shall bear interest from the date of the original judgment entered by the trial court.

The trial court's awards of attorneys fees and costs are vacated. The cause is remanded to the United States District Court for the Northern District of Oklahoma for further proceedings in accordance with the order and opinion of this Court and with directions to reconsider its awards of costs and attorneys fees at the trial in the light of the action taken in this court, and with directions that the parties should bear their own costs and attorneys fees incurred in this appeal.

/s/ HOWARD K. PHILLIPS

Howard K. Phillips, Clerk

Appendix E

MARCH TERM—MARCH 27, 1975

Before The Honorable David T. Lewis, Chief Judge, The Honorable Delmas C. Hill, The Honorable Oliver Seth, The Honorable William J. Holloway, Jr., The Honorable Robert H. McWilliams, The Honorable James E. Barrett and The Honorable William E. Doyle, Circuit Judges

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Nos. 73-1874, 73-1875, 73-1876, 73-1877, 73-1878, 73-1961 and 73-1962

THE TELEX CORPORATION and TELEX COMPUTER PRODUCTS, INC.,
Plaintiffs-Appellees-Appellants (and Appellants on Counterclaim),

vs.

INTERNATIONAL BUSINESS MACHINES CORPORATION,
Defendant-Appellant-Appellee (and Cross-Appellant on Counterclaim).

This matter comes on for consideration of the petition for rehearing and suggestion for rehearing en banc filed by the Telex Corporation in the captioned cases, and the response thereto filed by International Business Machines.

Upon consideration whereof, the petition for rehearing is denied by Circuit Judges Seth, McWilliams and Doyle to whom the cases were argued and submitted.

The petition for rehearing having been denied by the original panel to whom the cases were argued and submitted and no member of the panel nor judge in regular active service on the Court having requested that the Court be polled on rehearing en banc, Rule 35, Federal Rules of Appellate Procedure, the suggestion for rehearing en banc is denied. Chief Judge Lewis did

not participate in consideration of the petition for rehearing or the suggestion for rehearing en banc.

A true copy
Teste
[Seal]
Howard K. Phillips
Clerk, U.S. Court of
Appeals, Tenth Circuit
By /s/MARY A. SHERMAN
Deputy Clerk

/s/ HOWARD K. PHILLIPS
Howard K. Phillips, Clerk